



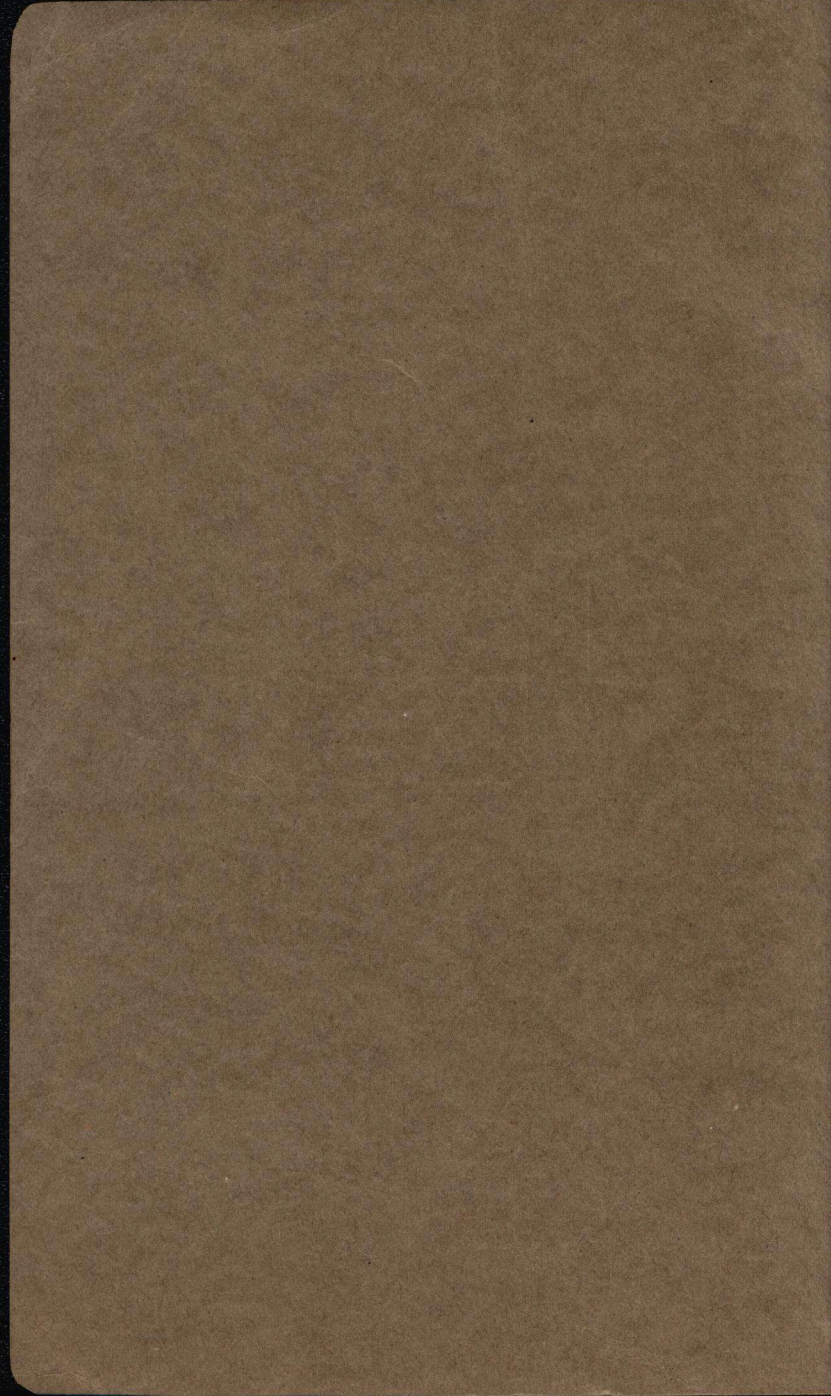
SMALL TOOLS

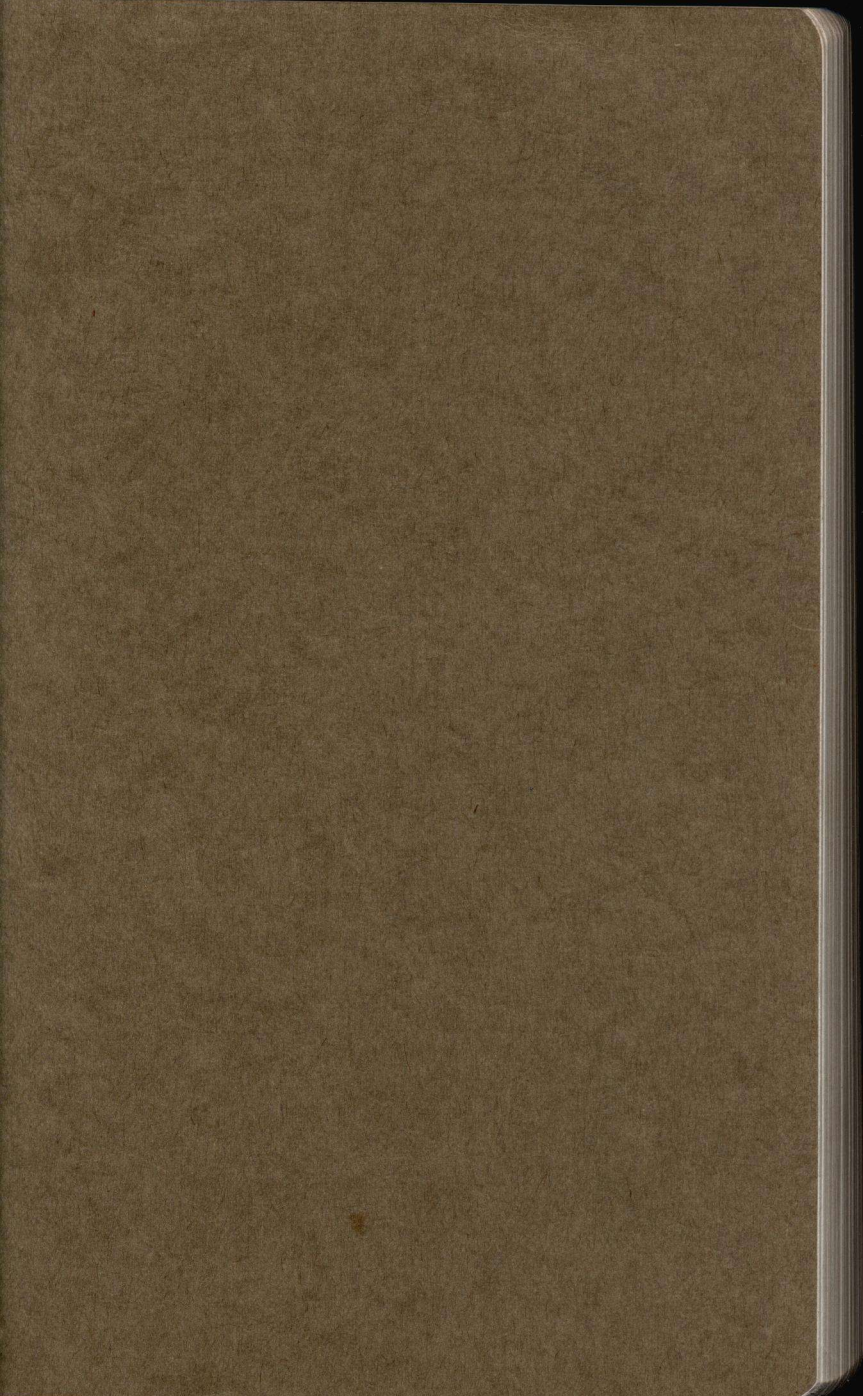
Catalog No. 46

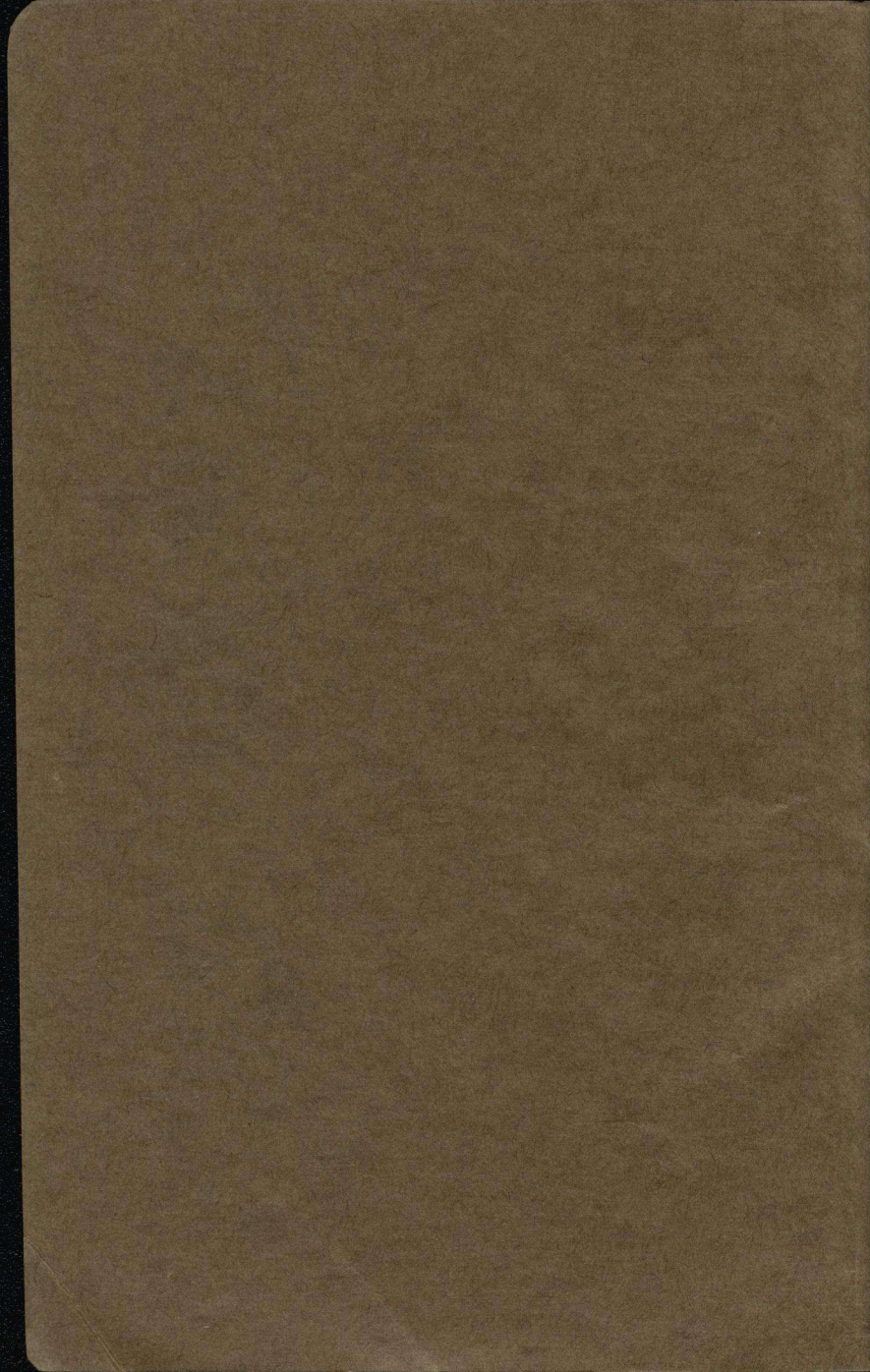


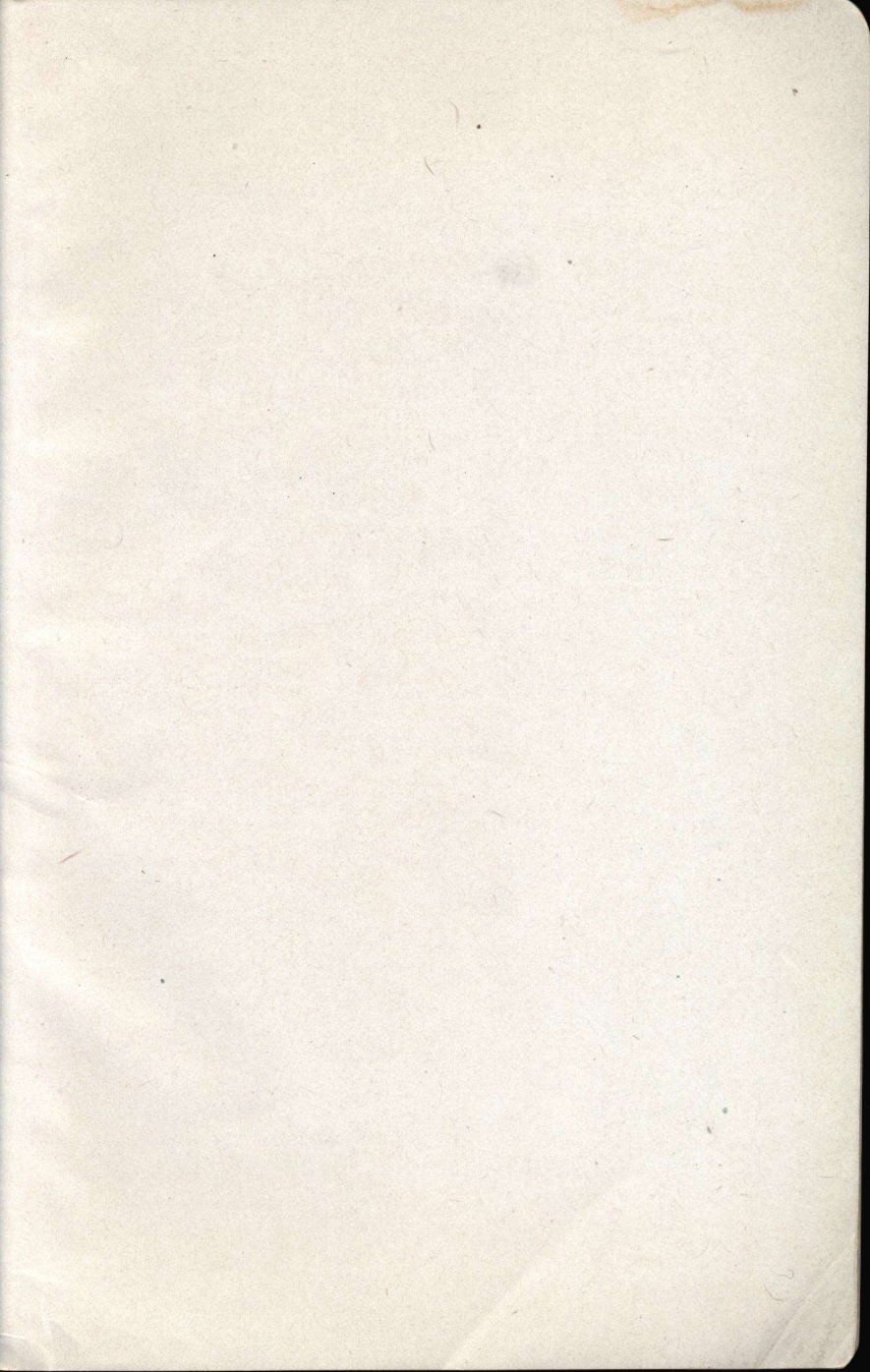
Taps & Dies
Screw Plates
Drills & Reamers
Milling Cutters
Pipe Tools

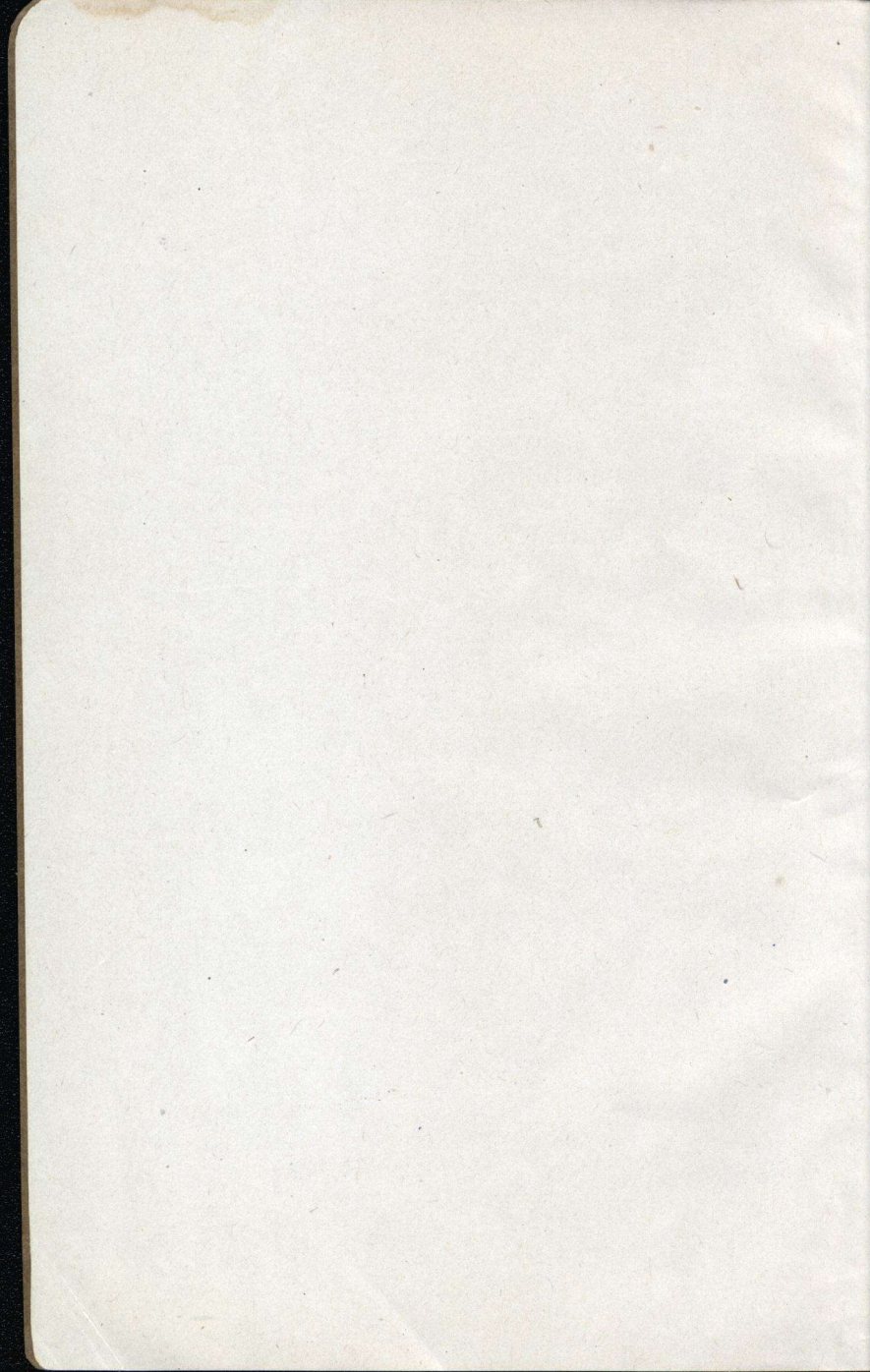


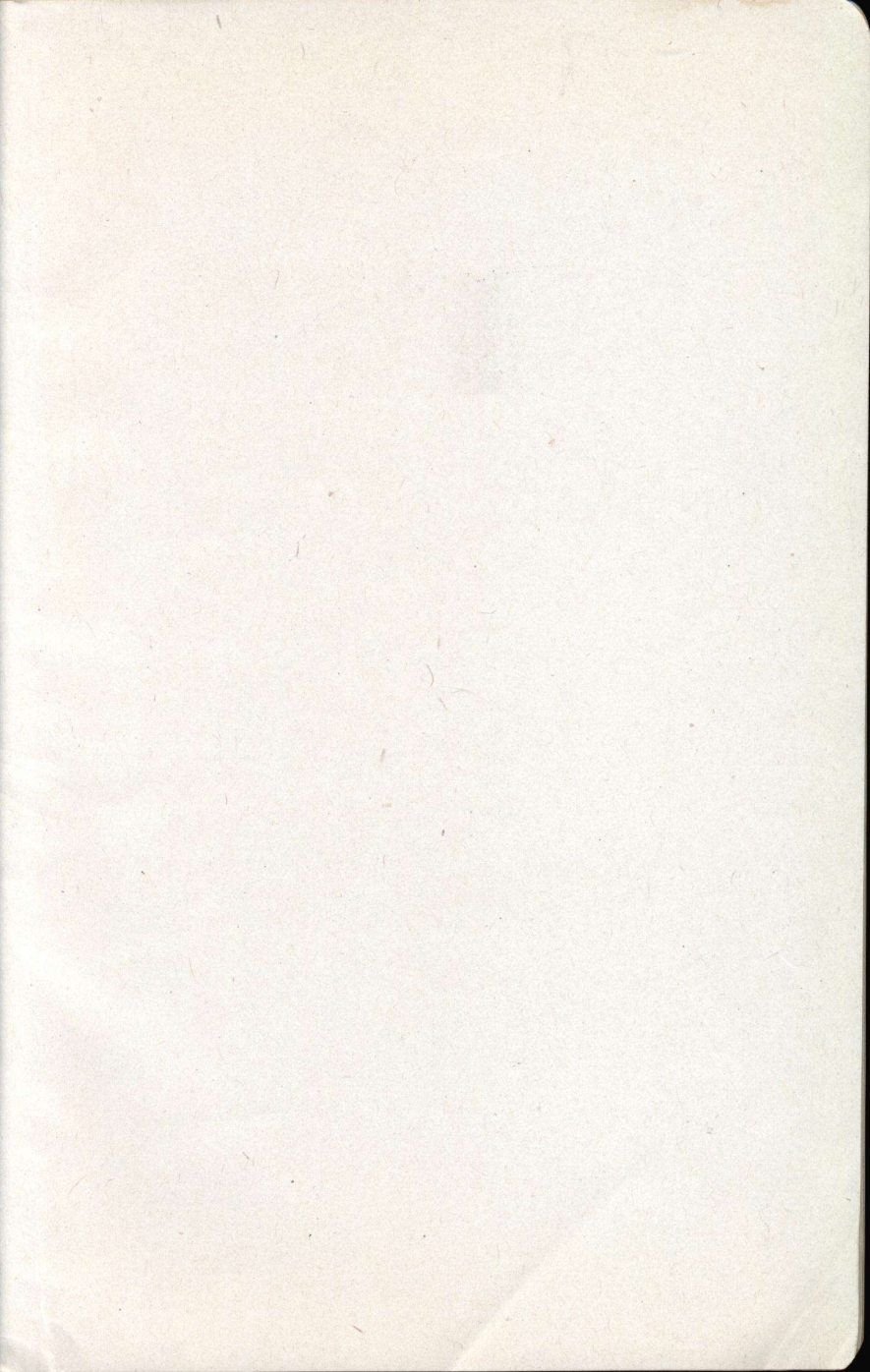


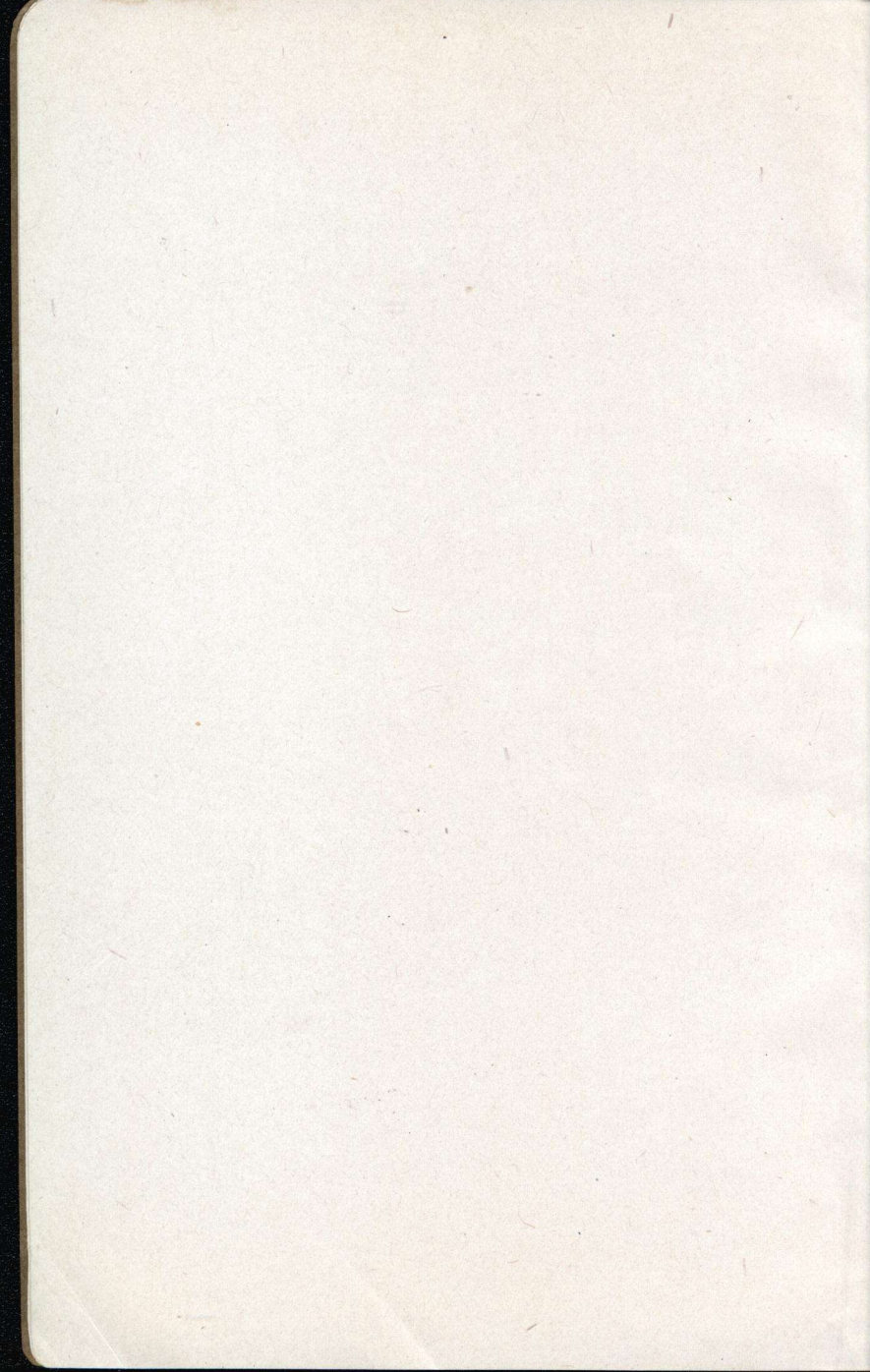


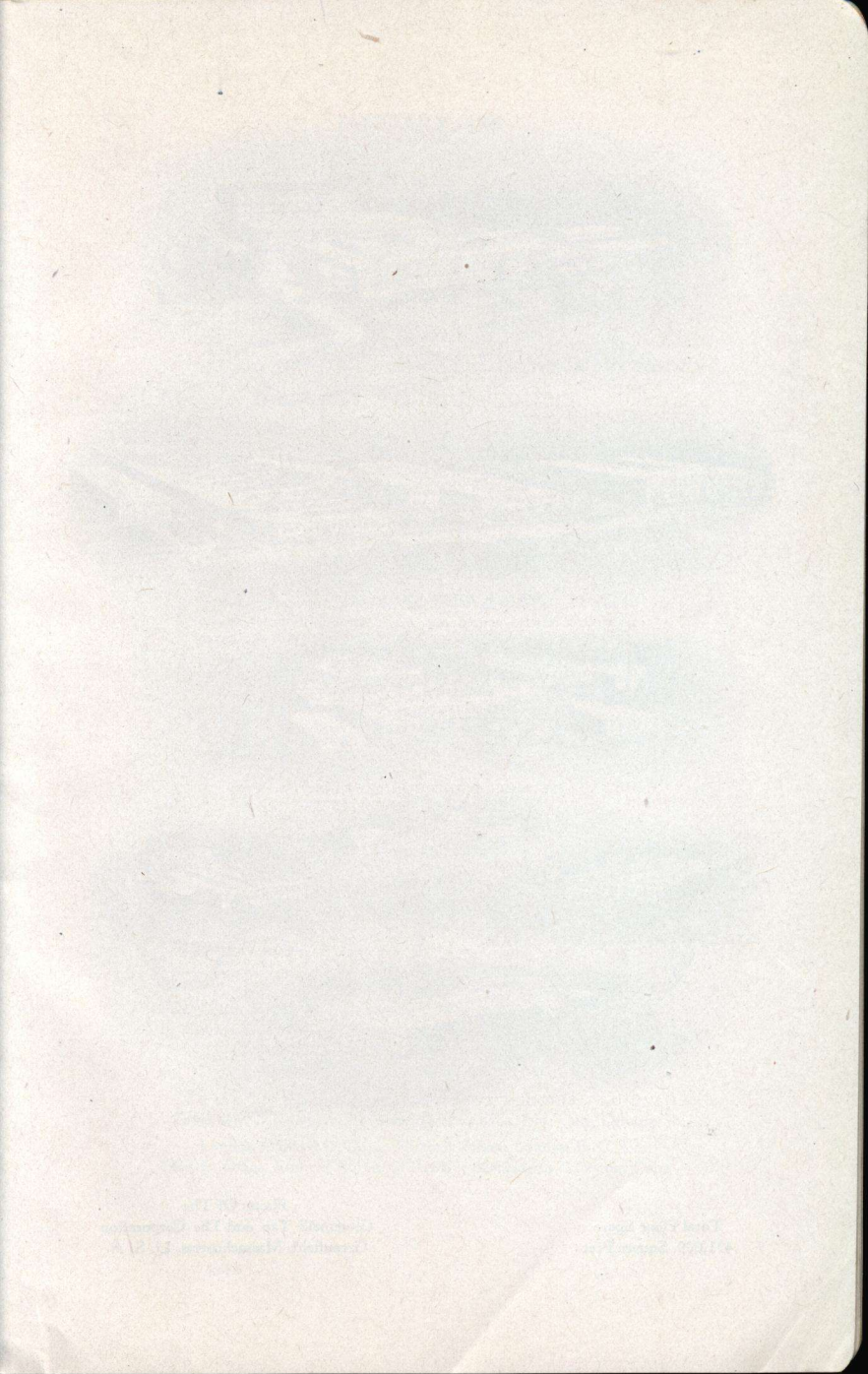


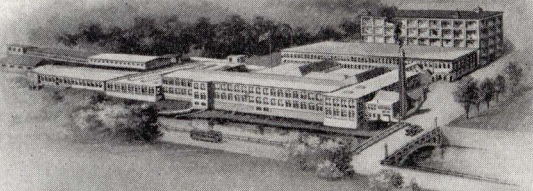




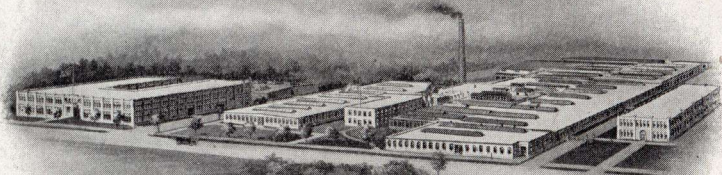








WILEY AND RUSSELL MFG. CO. PLANT



WELLS BROS. CO. PLANT



F.E. WELLS AND SON CO. PLANT



GTD CORPORATION LTD. OF CANADA



FORGE PLANT



BOX FACTORY



LINCOLN TWIST DRILL CO. PLANT

Total Floor Space
451,009 Square Feet

Plants Of The
Greenfield Tap and Die Corporation
Greenfield, Massachusetts, U. S. A.

JANUARY, 1921



SMALL TOOLS

Taps and Dies, Screw Plates, Drills,
Reamers, Milling Cutters,
Pipe Tools

Catalog No. 46

This Catalog supersedes GTD Catalogs Nos. 40, 42 and all others formerly issued under the names of the following constituent companies of this corporation, viz.:

Wells Brothers Company	F. E. Wells & Son Co.
Wiley & Russell Mfg. Co.	A. J. Smart Mfg. Co.
Lincoln Twist Drill Co.	

Cable Address

"Getede" Greenfield, Massachusetts



New York Store and Warehouse, 15 Warren St., New York, N. Y.

Chicago Store and Warehouse, 13 So. Clinton St., Chicago, Ill.

Cleveland Office, 1143 Locomotive Engineers Bldg.

Detroit Office, 236 Congress St., W.

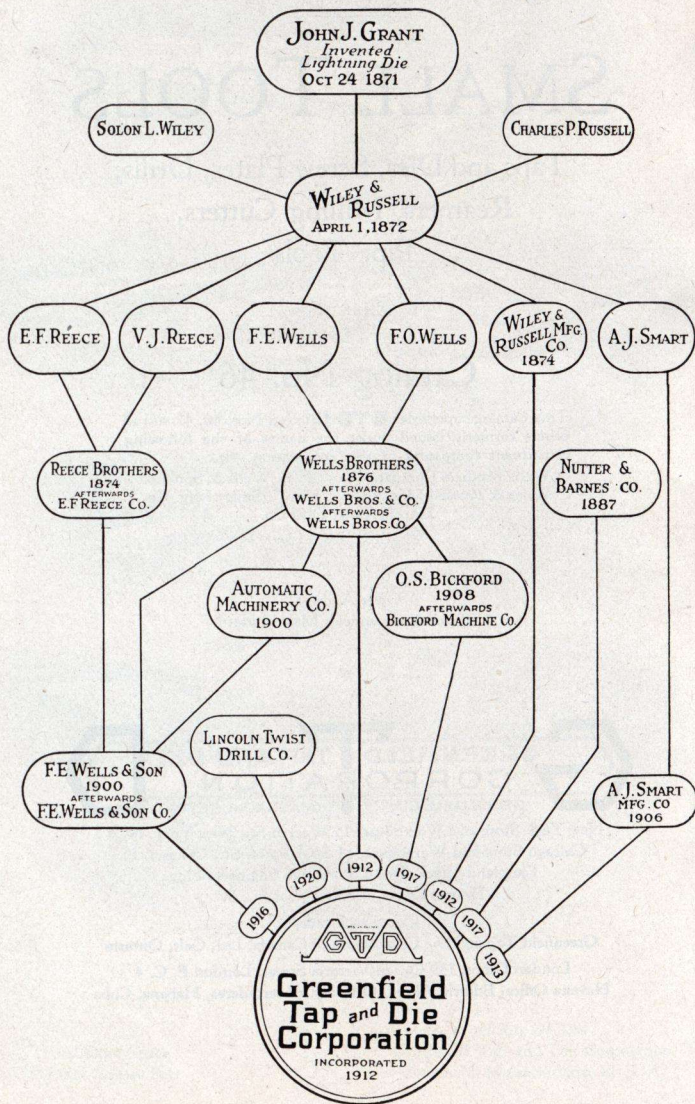
Canadian Factory:

Greenfield Tap and Die Corporation of Canada, Ltd. Galt, Ontario

London Office, 139 Queen Victoria Street, London E. C. 4

Havana Office, Edificio Abreu, O'Reilly y Mercaderes, Habana, Cuba

Historical Development of the Greenfield Tap and Die Corporation



GTD History

The Greenfield Tap and Die Corporation is an amalgamation of seven concerns, Wells Brothers Company, Wiley & Russell Mfg. Company, F. E. Wells & Son Company, A. J. Smart Mfg. Company, Nutter and Barnes Company, Lincoln Twist Drill Company and Bickford Machine Company. There are six separate and distinct plants housing these companies as well as a drop-forging shop and a woodworking plant for the manufacture of screw plate boxes. In addition, the corporation maintains a Canadian plant at Galt, Ontario—Greenfield Tap and Die Corporation of Canada, Limited. The first four concerns have always been leaders in the manufacture of taps and dies.

Wiley & Russell Mfg. Company was established in 1872 and ever since has put out the highest grade of screw-cutting tools, machines and reamers. They were the first to manufacture machine-relieved taps.

The E. F. Reece Company was founded in 1874 and marketed the original Round Adjustable or "Button" Die, also a line of Screw Plates, Die Stocks, Taps, Tap Wrenches, and Reamers. This company was later consolidated with the F. E. Wells & Son Company, who were then making a full line of Pipe and Machine Tools, including Grinders, Lathes, Hand Screw Machines, etc. The machine tools were formerly made by the Automatic Machine Co., which was bought out by the F. E. Wells & Son Co., in 1907.

Wells Brothers Company organized two years later, 1876, developed into the largest tap and die concern in the country, if not in the world. The enviable reputation created by this company's products in every civilized country, is one of the corporation's greatest assets.

The A. J. Smart Mfg. Company was founded in 1906 to produce taps, dies and reamers of exceptionally high grade. This company's equipment is used by the corporation for special work only.

The Nutter and Barnes Company, formerly of Hinsdale, N. H., was originally organized in Boston in 1887 for the production of high speed cutting-off machines for bars and pipe, and automatic saw and cutter sharpeners.

The Lincoln Twist Drill Company succeeded, in 1917, The Lincoln-Williams Twist Drill Company, which was founded in 1903. It has in this comparatively short time gained a place among the foremost manufacturers of high grade twist drills, and milling cutters.

The Greenfield Tap and Die Corporation manufactures nearly every conceivable screw-cutting tool, machine or appliance, as well as gages for any manufacturing operation, twist drills, metal cutting-off machines, lathes, grinders, milling cutters and pipe tools.



General Information

Ordering

To avoid possible misinterpretation, use catalog terms and numbers. Be sure that your instructions are complete.

Shipping instructions should be noted on every order.

Variations from catalog listing in form, size, pitch, etc., will be classed as special and subject to special prices.

Prices given in this catalog are list prices, subject to discount, which will be quoted upon application.

Guarantee

All **GTD** products are guaranteed against defects in material and workmanship.

Should any defects become apparent in any of our products, before returning anything to us, please notify us promptly.

The United States Standard Thread

We strongly advise the adoption and use of the United States Standard thread in all cases where this form is possible. For convenience and to encourage the use of this form of thread, we list additional pitches under the heading "USF." This will give users the greater number of threads per inch for each size, and, together with the standard pitches, will cover practically any need.

The American Society of Mechanical Engineers have recommended this form of thread in the ASME Standard and the Society of Automotive Engineers have adopted it for the SAE Standard. In addition to the above, the United States Standard has been adopted by the United States government and practically all the railroads and leading manufacturers of the country.

Order Taps and Dies with United States Standard Threads.

SCREW PLATE SECTION

Single and Two Stock
Full Mounted
Automotive
Sets with Drills

	Pages		Pages
"Button" Die	52-57	"Little Giant"	18-31
"Button" Die with Drills	76	"Little Giant" with Drills	73
GTD Opening Die . . .	14-17	Metric	59-72
"Green River"	38-45	"OK"	32-37
"Lightning"	46-51	Tap and Drill Kits . . .	74, 75



Changes in Screw Plate Numbers

Important Notice

In the direction of uniformity and to permit easier ordering and selling of our various screw plates, please note that in the following pages the assortments of our "OK," "Green River," GTD Opening and "Lightning" Screw Plates have been *renumbered* to conform to the system under which the "Little Giant" Screw Plates have always been numbered.

In this system in the "Little Giant" line,
Nos. 0 to 50 indicate Single Mounted Screw Plates, with taper taps.
Nos. 101 to 150 indicate Single Mounted Screw Plates, with sets of Hand Taps.

Nos. 31 to 312 indicate automobile screw plates.

Nos. 61 to 650 indicate Full Mounted Screw Plates, with taper taps.

Nos. 41 to 467 indicate Metric Screw Plates.

The prefixes "OK," 5000, 6000 and 8000 indicate respectively the other screw plate lines.

The last digit No. 1 indicates five sizes, $\frac{1}{4}$ to $\frac{1}{2}$ inch (in the case of Metric, corresponding sizes). The last digit No. 5 indicates seven sizes, $\frac{1}{4}$ to $\frac{3}{4}$ inch. The last digit No. 7 indicates nine sizes, $\frac{1}{4}$ to 1 inch, etc. One-half always indicates the addition of the $\frac{9}{16}$ size to the preceding assortment.

"Little Giant"		"OK"		"Green River"		GTD Opening		"Lightning"	
Old	New	Old	New	Old	New	Old	New	Old	New
11	0	.....	.....	1100	5000			1191	8000
1	same	OK 1	same	1101	5001	601	6001	2025	8001
2	same	OK 4	OK 2	1124	5002	.....	.....	1189	8002
3	same	.....	.....				
4	same	.....	.....	1108	5004	.....	.....	1195	8004
5	same	OK 5	same	1104	5005	605	6005	1193	8005
5½	same	OK 5½	same	1125	5005½	605½	6005½	1207	8005½
6	same	.....	.....	1110	5006	.....	.....	1197	8006
7	same	OK 10	OK 7	1112	5007	.....	.....	1199	8007
7½	same	OK 10½	OK 7½						
8	same								
9	same	.....	.....	1114	5009	.....	.....	1204	8009
9½	same								
20	same								
25	same	.....	.....	1116	5025	.....	.....	1200	8025
30	same								
40	same	.....	.....	1119	5040				
50	same	.....	.....	1120	5050	.....	.....	1205	8050

Changes in Screw Plate Numbers

"Little Giant"		"OK"		"Green River"		GTD Opening		"Lightning"	
Old	New	Old	New	Old	New	Old	New	Old	New
101	same	.....	.....	.....	.....	.....	.....	2351	8101
102	same								
103	same								
104	same								
105	same	.....	.....	.....	.....	.....	.....	2353	8105
105½	same								
107	same	.....	.....	.....	.....	.....	.....	2359	8107
107½	same								
109	same								
109½	same								
130	same								
140	same								
150	same								
305	31	OK 20	OK 31	1460	5031				
306	disc't'd								
309	35	OK 31	OK 35	1464	5035				
.....	.....	OK 31½	OK 35½						
.....	37	OK 32	OK 37						
307	{ 37½	OK 32½	OK 37½	1462	{ 5037½				
	less ⅛				less ⅛				
310	same	OK 120	OK 310	1468	5310	610	6310		
311	same	OK 532	OK 311	1469	5311	611	6311		
.....	.....	OK 531	OK 315						
312	same	OK 1033	OK 312	1469½	5312				
.....	.....	OK 1032	OK 317						
61	same	OK 71	OK 61	.....	.....	.....	.....	1240	8061
62	same								
63	same								
64	same								
65	same	OK 75	OK 65	.....	.....	.....	.....	1223	8065
65½	same	OK 75½	OK 65½	.....	.....	.....	.....	1215	8065½
67	same	OK 77	OK 67	.....	.....	.....	.....	1229	8067
67½	same	OK 77½	OK 67½						
640	same								
650	same								
41	same	3401	OK 41	3101	5041	4601	6041	3025	8041
45	same	3405	OK 45	3104	5045	4605	6045	3193	8045
47	same	3410	OK 47	3112	5047	.....	.....	3199	8047
401	same	.....	.....	.....	.....	.....	.....	3351	8401
405	same	.....	.....	.....	.....	.....	.....	3353	8405
407	same	.....	.....	.....	.....	.....	.....	3359	8407
461	same	.....	.....	.....	.....	.....	.....	3240	8461
465	same	.....	.....	.....	.....	.....	.....	3223	8465
467	same	.....	.....	.....	.....	.....	.....	3229	8467

Note—"OK" 73, 76, 76½, 79, 79½ discontinued.

GTD

Opening Die Stock

Patented October 26, 1915



Efficiency

On ordinary threading operations almost as much time is consumed in backing the die off the finished thread as is required in the actual cutting operation. Furthermore, in reversing the die the thread is very liable to injury from chips wedging under the die lands, a circumstance which also makes the withdrawal exceptionally slow and difficult.

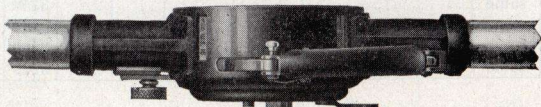
All this unnecessary labor and loss of time is eliminated by the releasing features of the **GTD** Opening Die Stock.

Quick Release

This stock works like any first class die stock while cutting the thread but as soon as the desired length has been threaded a slight movement of the lever opens the die, releasing the thread so that the die may be pulled straight off the work.

Construction

The Opening Die Stock is as simple in construction as it is light in weight and compact in size. In the first place, it is an all steel tool devoid of any malleable iron parts and consequently lighter and stronger than any other stock of equal capability,—and it is simple in operation.



Side View

GTD Opening Die Stock

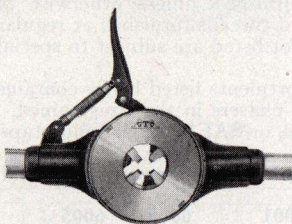


Each part of the Opening Die Stock is made of the material which is best suited to render the service required of it.

The light, strong shell is made from welded steel stampings—the body is of open hearth steel—the chasers are made of a special alloy steel such as is used for “Acorn” Dies and “Gun” Taps—the opening and closing cam is machined from a drop-forging—the adjustable guide is of pressed steel and the handles are of hollow steel tubing.

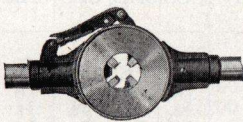
All parts subject to wear are hardened and all close fitting parts are made to gages.

Chasers are very easily removed for sharp-



Face View, Chasers Opened

ening or inter-changing. There is nothing to get out of order and no danger of clogging by chips, as there are no openings in the center of the body.



Face View, Closed for Cutting



Rear View Closed, showing Adjustable Guide

Easy Adjustment

The die is very easily adjusted to cut larger or smaller than nominal size and the chasers are quickly changed from one cutting size to another. No tools of any sort are required. Nominal size is indicated by marks on circumference of stock and on body of locking lever.

An Ideal Tool

This is an extremely free cutting die and because it cuts so easily and is so light and handy it is destined to fill a new place among screw-cutting tools.

The GTD Opening Die Screw Plates



USS threads furnished unless otherwise ordered. SAE and Whitworth Standard threads furnished at regular prices if specified. Sizes and threads not listed are subject to special prices. Left hand dies are special.

Each of the assortments listed below contains one **GTD** Opening Die Stock with chasers in the sizes named, USS or Whitworth Standard taper taps, or SAE Standard plug taps, one No. 6 adjustable tap wrench.

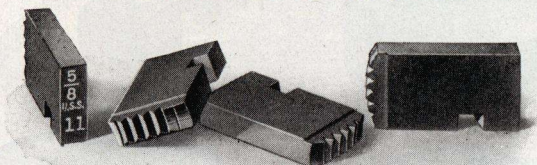
Repair parts for following screw plates listed on next page.

No.	6001	6005	6005 1/2	6310		6311	
Form of Thread	USS	USS	USS	USS	SAE	USS	SAE
Cutting Sizes	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4
Length of Stock Inches	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2		
Net Weight lbs.	9 1/2	11 1/4	11 1/4	11 1/4	16 3/4		
Price Dollars	25.00	35.00	38.00	40.00	70.00		

Repair Parts

GTD Opening Die Screw Plates

Chasers for GTD Opening Die Stock



Sizes and Prices

Size	Price	USS	SAE	Whit.
$\frac{1}{4}$	\$2.00	20	28	20
$\frac{5}{16}$	2.00	18	24	18
$\frac{3}{8}$	2.00	16	24	16
$\frac{7}{16}$	2.00	14	20	14
$\frac{1}{2}$	2.00	13	20	12
$\frac{9}{16}$	2.00	12	18	12
$\frac{5}{8}$	2.00	11	18	11
$\frac{3}{4}$	2.00	10	16	10

Die stock separately, cutting sizes $\frac{1}{4}$ "- $\frac{3}{4}$ ".

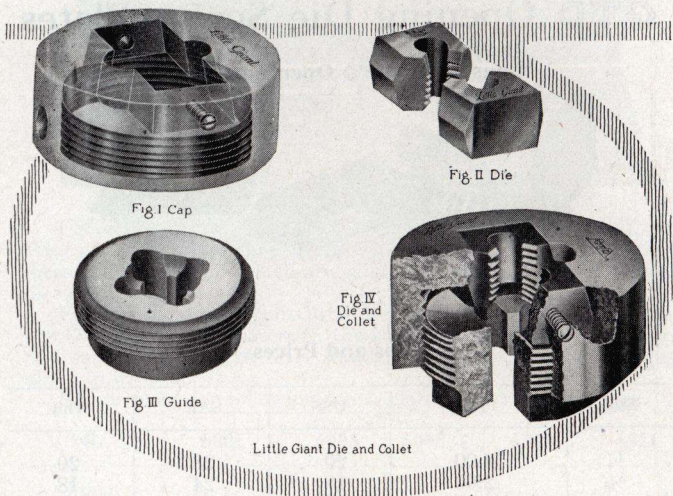
Price, each \$10.00

Taps for above sets listed on page 85.

Tap wrenches on page 113.

Little Giant

Screw Plates



The die proper is in two pieces (Fig. II); each half having two cutting edges. The die can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel.

The die is held in a cap (Fig. I). The edges of the die are bevelled to the same angle as the bevelled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is bevelled on both sides to permit reversing the die so that work may be threaded either through the guide or from the face, determined by the character of the work.

After the die is laid in the slot in the cap, a screw-guide (Fig. III) wedges it tight. The die is thus held in a three-angle grip, the surest grip known to the science of mechanics. It cannot tilt out of alignment.

When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal. Yet it is easily taken apart, the die sharpened, and re-assembled.

Price of "*Little Giant*" dies on pages 126, 127.

Little Giant Screw Plates

Single Stock



These assortments contain plug taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. BSF or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 26 and 27.

Repair parts for following screw plates listed on next page.

No.	Fractional					Machine Screw	
	A 1	A 1½	A 2	A 2½	A 3	AA 2	AA 4
Cutting Sizes and Threads per Inch		1/16-64		1/16-64		4-36	4-36
				5/64-60		6-32	6-32
		3/32-50		3/32-50		8-32	8-32
			7/64-48	7/64-48	7/64-48	10-24	10-24
	1/8-40	1/8-40	1/8-40	1/8-40	1/8-40		10-32
			9/64-40	9/64-40	9/64-40	12-24	12-24
	5/32-36	5/32-36	5/32-36	5/32-36	5/32-36		14-20
	3/16-24	3/16-24	3/16-24	3/16-24	11/64-32		
					3/16-24		
	7/32-24	7/32-24	7/32-24	7/32-24	13/64-24		
					7/32-24		
	1/4-20	1/4-20	1/4-20	1/4-20	15/64-24		
Collets Diam. In.	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Stocks Length In.	7½	7½	7½	7½	7½	7½	7½
Tap Wrench No.	0	0	0	0	0	0	0
Net Weight lbs.	2½	3	3	4	4	2½	3
Price Dollars	11.50	14.50	14.50	19.50	19.50	11.50	14.50

No. A-10

1/8-40 5/32-36 3/16-24 7/32-24 1/4-20 5/16-18 3/8-16

Price **\$18.25.**

1¼" diam. collets for sizes 1/4" and smaller;

1½" diam. collets for sizes 5/16" and larger;

2 stocks 7½" and 13½" long.

Adjustable tap wrench No. 4

Weight 5½ lbs.

Repair Parts for *Little Giant* Screw Plates

Shown on preceding page

The following table of screw plate parts covers only those sizes used in the screw plates described on preceding page.

Cutting Size	Tap	Die	No. Collet	Collet			Stock	
				Cap	Guide	Com- plete	Length	Price
M. S.								
4	\$.40	\$.75	A-1 1 1/4" diam.	.35	.20	.55	7 1/2"	\$1.25
6	.35	.75						
8	.35	.75						
10	.40	.75						
12	.45	.75						
14	.45	.75						
16	.45	.75						
Fract'l								
1/16	.50	.75	A-10 1 5/8" diam.	.50	.30	.80	13 1/2"	2.00
5/64	.45	.75						
3/32	.40	.75						
7/64	.40	.75						
1/8	.35	.75						
9/64	.35	.75						
5/32	.35	.75						
11/64	.35	.75						
3/16	.40	.75						
13/64	.40	.75						
7/32	.45	.75						
15/64	.45	.75						
1/4	.45	.75						
5/16	.50	1.00						
3/8	.55	1.25						

Tap Wrenches

No.	Capacity		Length	Price
	Mach. Screw	Fractional		
0	0 to 18	1/16 to 1/4	7"	\$2.00
4	0 to 24	1/16 to 3/8	9"	3.00

Little Giant Single Stock Screw Plates



Assortment No. 0 contains plug tap for $\frac{3}{16}$ size, taper for all others. Nos. 0 and 1 contain bit brace shanks. Remaining assortments contain taper taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered.

SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 26 and 27.

Repair parts for following screw plates listed on page 31.

No.	0	1	2	3	4	5	5½
Cutting Sizes Inches and Threads per Inch	$\frac{3}{16}$ -24 $\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13	$\frac{1}{4}$ -20 $\frac{3}{8}$ -16 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10	 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	 $\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{9}{16}$ -12 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10	 $\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{9}{16}$ -12 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10
Collets, Diam. In.	2	2	2¾	2¾	2¾	2¾	2¾
Stocks, Length, In.	14½	14½	23	26	26	23	23
Tap Wrenches No.	5	5	6	7	7	6	6
Net Weight lbs.	9½	9	17	18	20½	20	22
Price, Dollars	20.00	18.50	22.75	26.25	29.25	27.50	30.75

Little Giant Single Stock Screw Plates



These assortments contain taper taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered.

SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 26 and 27.

Repair parts for following screw plates listed on page 31.

No.	Single Stock					
	6	7	7½	20	25	30
Cutting Sizes and Threads per Inch	3/8-16 7/16-14 1/2-13 5/8-11 3/4-10 7/8-9 1-8	1/4-20 5/16-18 3/8-16 7/16-14 1/2-13 5/8-11 3/4-10 7/8-9 1-8	1/4-20 5/16-18 3/8-16 7/16-14 1/2-13 9/16-12 5/8-11 3/4-10 7/8-9 1-8	5/8-11 3/4-10 7/8-9 1-8 1 1/8-7 1 1/4-7	7/8-9 1-8 1 1/8-7 1 1/4-7 1 3/8-6 1 1/2-6	1 1/8-7 1 1/4-7 1 3/8-6 1 1/2-6
Collets Diam. Inches	2¾	2¾	2¾	4	4½	4½
Stocks Length Inches	26	26	26	40	52	52
Tap Wrench No.	7	5, 7	5, 7	7½	8	8
Net Weight lbs.	23	27	29	49½	71	58
Price Dollars	35.00	42.00	44.25	53.50	70.00	59.00

Little Giant Two Stock Screw Plates



These assortments contain taper taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified. Automobile assortments listed on pages 26 and 27.

Repair parts for following screw plates listed on page 31.

Two Stock

No.	8	9	9½	40	50
Cutting Sizes and Threads per Inch	¼-20	¼-20	¼-20	¼-20	¼-20
	⅜-18	⅜-18	⅜-18	⅜-18	⅜-18
	⅝-16	⅝-16	⅝-16	⅝-16	⅝-16
	⅞-14	⅞-14	⅞-14	⅞-14	⅞-14
	1½-13	1½-13	1½-13	1½-13	1½-13
	⅝-11	⅝-11	⅝-11	⅝-11	⅝-11
	¾-10	¾-10	¾-10	¾-10	¾-10
		⅞-9	⅞-9	⅞-9	⅞-9
		1-8	1-8	1-8	1-8
				1½-7	1½-7
				1¾-7	1¾-7
					1½-6
					1½-6
Collets	2,	2,	2,	2¾,	2¾,
Diam. Inches	2¾	2¾	2¾	4	4½
Stocks	14½,	14½,	14½,	23,	26,
Length Inches	26	29	29	40	52
Tap Wrench		5,	5,	6,	6,
No.	6	7	7	7½	8
Net Weight					
lbs.	19½	26	26½	57½	84
Price					
Dollars	30.00	43.50	46.50	68.50	92.00

Nos. 8, 9 and 9½ have 2" collets for sizes ⅞" and smaller, and 2¾" collets for sizes 1½" and larger, also bit brace shanks fitting 2" collets.

No. 40 has 2¾" collets for sizes ¾" and smaller, and 4" for sizes ⅞" and larger.

No. 50 has 2¾" collets for sizes 1" and smaller, and 4½" for sizes 1½" and larger.

Little Giant Screw Plates

With Sets of Taper, Plug and Bottoming Hand Taps



These assortments contain taper, plug and bottoming hand taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 26 and 27.

Sets of Serial Taps listed on page 87 will be substituted without affecting price.

Repair parts for following screw plates listed on page 31.

No.	101	102	103	104	105	105½
Cutting Sizes and Threads per Inch	¼-20 ⅝-16-18 ⅜-16 ⅞-14 ½-13	¼-20 ⅜-16 ½-13 ⅝-11 ¾-10	⅝-11 ¾-10 ⅞-9 1-8	½-13 ⅝-11 ¾-10 ⅞-9 1-8	¼-20 ⅝-16-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10	¼-20 ⅝-16-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10
Collets, Diam. Inches	2	2¾	2¾	2¾	2¾	2¾
Stocks, Length, Inches	14½	23	26	26	23	23
Tap Wrench No.	5	6	7	7	6	6
Net Weight lbs.	9¾	20	23½	26	23	25
Price Dollars	22.00	29.50	35.50	39.50	35.75	39.75

Little Giant Screw Plates

With Sets of Taper, Plug and Bottoming Hand Taps



These assortments contain taper, plug and bottoming hand taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 26 and 27.

Sets of Serial Taps listed on page 87 will be substituted without affecting price.

Repair parts for following screw plates listed on page 31.

No.	Single Stock			Two Stock			
	107	107½	130	109	109½	140	150
Cutting Sizes and Threads per Inch	¼-20	¼-20		¼-20	¼-20	¼-20	¼-20
	⅜-18	⅜-18		⅜-18	⅜-18	⅜-18	⅜-18
	½-16	½-16		½-16	½-16	½-16	½-16
	⅞-14	⅞-14		⅞-14	⅞-14	⅞-14	⅞-14
	1-13	1-13		1-13	1-13	1-13	1-13
		9/16-12			9/16-12		
	5/8-11	5/8-11		5/8-11	5/8-11	5/8-11	5/8-11
	¾-10	¾-10		¾-10	¾-10	¾-10	¾-10
	7/8-9	7/8-9		7/8-9	7/8-9	7/8-9	7/8-9
	1-8	1-8		1-8	1-8	1-8	1-8
			1 1/8-7			1 1/8-7	1 1/8-7
			1 1/4-7			1 1/4-7	1 1/4-7
			1 3/8-6			1 3/8-6	1 3/8-6
			1 1/2-6			1 1/2-6	1 1/2-6
Collets Diam. In.	2¾	2¾	4½	2, 2¾	2, 2¾	2¾, 4	2¾, 4½
Stocks Length In.	26	26	52	14½, 29	14½, 29	23, 40	26, 52
Tap Wrench No.	5, 7	5, 7	8	5, 7	5, 7	6, 7½	6, 8
Net Weight lbs.	34	35	70	32	33	68	97
Price Dollars	50.50	54.50	78.00	56.00	60.00	89.00	120.00

Nos. 109 and 109½ have 2" collets for sizes 7/16" and smaller, and 2¾" collets for sizes 1/2" and larger.

No. 140 has 2¾" collets for sizes 3/4" and smaller, and 4" collets for sizes 1/8" and larger.

No. 150 has 2¾" collets for sizes 1" and smaller, and 4½" collets for sizes 1 1/8" and larger.

Little Giant Screw Plates

(Automobile and Other Fine Thread Purposes)

With SAE Threads



These sets contain plug taps unless otherwise specified, "*Little Giant*" dies in the cutting sizes and with threads per inch as listed below.

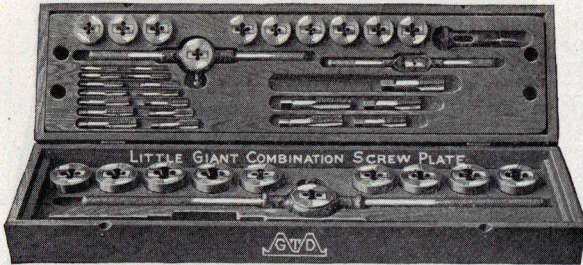
Repair parts for following screw plates listed on page 31.

No.	31	35	37	37½
Cutting Sizes and Threads per Inch	¼-28	¼-28	¼-28	¼-28
	⅝-24	⅝-24	⅝-24	⅝-24
	⅜-24	⅜-24	⅜-24	⅜-24
	⅞-20	⅞-20	⅞-20	⅞-20
	½-20	½-20	½-20	½-20
				⅞-18
Collets Dia. Inches		⅝-18	⅝-18	⅝-18
		¾-16	¾-16	¾-16
			⅞-14	⅞-14
			1-14	1-14
Stocks Length Inches	2	2¾	2¾	2¾
Tap Wrench No.	14½	23	26	26
Net Weight lbs.	5	6	5, 7	5, 7
Price Dollars	8	20	27	30
	18.50	27.50	42.00	44.25

Little Giant Screw Plates

(Automobile and Other Fine Thread Purposes)

With Combination USS and SAE Threads



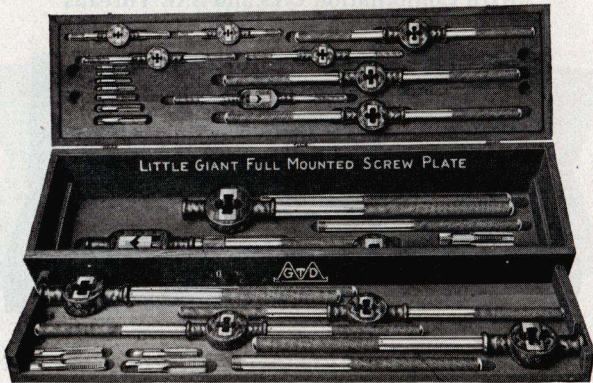
Whitworth threads substituted for USS in combination screw plates at regular prices.

The following combination screw plates contain USS taper taps, SAE plug taps, "Little Giant" dies for each size: 2" collets for sizes $\frac{1}{2}$ " and smaller, $2\frac{3}{4}$ " collets for sizes $\frac{9}{16}$ " and larger, and bit brace shank fitting 2" caps.

Repair parts for following screw plates listed on page 31.

No.	310		311		312	
	USS	SAE	USS	SAE	USS	SAE
Cutting Sizes and Threads per Inch	$\frac{1}{4}$ 20 $\frac{5}{16}$ 18 $\frac{3}{8}$ 16 $\frac{7}{16}$ 14 $\frac{1}{2}$ 13	$\frac{1}{4}$ 28 $\frac{5}{16}$ 24 $\frac{3}{8}$ 24 $\frac{7}{16}$ 20 $\frac{1}{2}$ 20	$\frac{1}{4}$ 20 $\frac{5}{16}$ 18 $\frac{3}{8}$ 16 $\frac{7}{16}$ 14 $\frac{1}{2}$ 13 $\frac{9}{16}$ 12 $\frac{5}{8}$ 11 $\frac{3}{4}$ 10	$\frac{1}{4}$ 28 $\frac{5}{16}$ 24 $\frac{3}{8}$ 24 $\frac{7}{16}$ 20 $\frac{1}{2}$ 20 $\frac{9}{16}$ 18 $\frac{5}{8}$ 18 $\frac{3}{4}$ 16	$\frac{1}{4}$ 20 $\frac{5}{16}$ 18 $\frac{3}{8}$ 16 $\frac{7}{16}$ 14 $\frac{1}{2}$ 13 $\frac{9}{16}$ 12 $\frac{5}{8}$ 11 $\frac{3}{4}$ 10 $\frac{7}{8}$ 9 1 8	$\frac{1}{4}$ 28 $\frac{5}{16}$ 24 $\frac{3}{8}$ 24 $\frac{7}{16}$ 20 $\frac{1}{2}$ 20 $\frac{9}{16}$ 18 $\frac{5}{8}$ 18 $\frac{3}{4}$ 16 $\frac{7}{8}$ 14 1 14
Collets Diam. Inches	2, $2\frac{3}{4}$		2, $2\frac{3}{4}$		2, $2\frac{3}{4}$	
Stocks Length Inches	14 $\frac{1}{2}$		14 $\frac{1}{2}$ 23		14 $\frac{1}{2}$ 29	
Tap Wrench No.	5		5, 6		5, 7	
Net Weight lbs.	14		31		45	
Price Dollars	29.25		56.00		79.00	

Little Giant Full Mounted Screw Plates



These assortments contain taper taps and "Little Giant" dies in the cutting sizes and with threads per inch as listed below. They are always ready for instant use. A full mounted stock for each cutting size.

USS threads furnished unless otherwise ordered.

SAE or Whitworth Standard threads furnished at regular prices if specified. Automobile assortments listed on pages 26 and 27.

Repair parts for following screw plates listed on page 31.

No.	61	62	63	64	65	65½	67	67½	640	650
Cutting Sizes and Th'ds per Inch	¼-20 ⅝-18 ¾-16 ⅞-14 ½-13	¼-20 ¾-16 ½-13 ⅝-11 ¾-10	 ⅝-11 ¾-10 ⅞-9 1-8	 ½-13 ⅝-11 ¾-10 ⅞-9 1-8	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10 ⅞-9 1-8	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10 ⅞-9 1-8 1½-7 1¼-7	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10 ⅞-9 1-8 1½-7 1¼-7 1⅜-6 1½-6	 ¼-20 ⅝-18 ¾-16 ⅞-14 ½-13 ⅞-12 ⅝-11 ¾-10 ⅞-9 1-8 1½-7 1¼-7 1⅜-6 1½-6
Tap Wren- ches No.	5	6	7	7	6	6	5, 7	5, 7	6, 7½	6, 8
Net Wt. lbs.	13½	22	18	30	24	28	40	42	61	100
Price Dollars	22.00	29.00	36.50	37.50	34.50	38.50	54.00	58.25	77.50	111.00



Little Giant Screw Plates

Condensed List

Set No.	No. Sizes	Capacity	Listed on Page	Price
A1	5	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	19	\$11.50
A1½	7	$\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	19	14.50
A2	7	$\frac{7}{64}$, $\frac{1}{8}$, $\frac{9}{64}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	19	14.50
A2½	10	$\frac{1}{16}$, $\frac{5}{64}$, $\frac{3}{32}$, $\frac{7}{64}$, $\frac{1}{8}$, $\frac{9}{64}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	19	19.50
A3	10	$\frac{7}{64}$, $\frac{1}{8}$, $\frac{9}{64}$, $\frac{5}{32}$, $\frac{11}{64}$, $\frac{3}{16}$, $\frac{13}{64}$, $\frac{7}{32}$, $\frac{15}{64}$, $\frac{1}{4}$	19	19.50
A10	7	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$	19	18.25
M1	5	With drills—otherwise same as A1	73	12.50
M2	7	“ “ “ “ “ A2	73	16.00
M3	10	“ “ “ “ “ A3	73	21.25
0	6	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	21	20.00
1	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	21	18.50
2	5	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	21	22.75
3	4	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	21	26.25
4	5	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	21	29.25
5	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	21	27.50
5½	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$	21	30.75
6	7	$\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	22	35.00
7	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	22	42.00
7½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	22	44.25
8	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	23	30.00
9	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	23	43.50
9½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	23	46.50
20	6	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½, 1¾	22	53.50
25	6	$\frac{7}{8}$, 1, 1½, 1¾, 1¾, 1½	22	70.00
30	4	1½, 1¾, 1¾, 1¾, 1½	22	59.00
40	11	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½, 1¾	23	68.50
50	13	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½	23	92.00
		1¾, 1¾, 1½	23	
101	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	24	22.00
102	5	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	24	29.50
103	4	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	24	35.50
104	5	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	24	39.50
105	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	24	35.75
105½	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$	24	39.75
107	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	25	50.50
107½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	25	54.50
109	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	25	56.00
109½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1"	25	60.00
130	4	1½, 1¾, 1¾, 1¾, 1½	25	78.00
140	11	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½, 1¾	25	89.00
150	13	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½	25	120.00
		1¾, 1¾, 1½	25	
31	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, SAE	26	18.50
35	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, SAE	26	27.50
37	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1" SAE	26	42.00
37½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1" SAE	26	44.25
310	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, USS $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ SAE	27	29.25

Concluded on next page



Little Giant Screw Plates

Condensed List (Concluded)

Set No.	No. Sizes	Capacity	Listed on Page	Price
Fractional (Continued)				
311	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$ USS $\frac{1}{4}$, $\frac{5}{16}$	27	\$56.00
312	10	$\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$ SAE	27	79.00
		$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 USS		
		$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 SAE		
61	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	28	22.00
62	5	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	28	29.00
63	4	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1	28	36.50
64	5	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1	28	37.50
65	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	28	34.50
65½	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$	28	38.50
67	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1	28	54.00
67½	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1	28	58.25
640	11	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½, 1¼	28	77.50
650	13	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1½, 1¼, 1¾, 1½	28	111.00
Machine Screw				
AA-2	5	4¾, 6¾, 8¾, 10¼, 12¼	19	11.50
AA-4	7	4¾, 6¾, 8¾, 10¼, 10¾, 12¼, 14¼	19	14.50
British Association				
A-04	5	01.0, 1.9, 2.81, 3.73, 4.66	61	11.50
A-06	7	01.0, 1.9, 2.81, 3.73, 4.66, 5.59, 6.53	61	14.50
A-09	10	01.0, 1.9, 2.81, 3.73, 4.66, 5.59, 6.53, 7.48		
		8.43, 9.39	61	19.50
A-510	6	5.59, 6.53, 7.48, 8.43, 9.39, 10.35	61	12.25
International Standard				
A-41	5	2.45, 3.60, 4.75, 5.90, 61.00	62	11.50
A-42	7	2.45, 2.5.45, 3.60, 3.5.60, 4.75, 5.90, 61.00	62	14.50
A412	8	3.60, 4.75, 5.90, 61.00, 71.00, 81.25, 91.25, 101.50	62	20.25
41	5	61.00, 71.00, 81.25, 101.50, 121.75	62	18.50
45	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	62	27.50
47	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	62	42.00
401	5	61.00, 71.00, 81.25, 101.50, 121.75	63	22.00
405	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	63	35.75
407	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	63	50.50
461	5	61.00, 71.00, 81.25, 101.50, 121.75	63	22.00
465	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	63	34.50
467	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	63	54.00

Repair Parts for *Little Giant* Screw Plates

Shown on pages 19 to 28

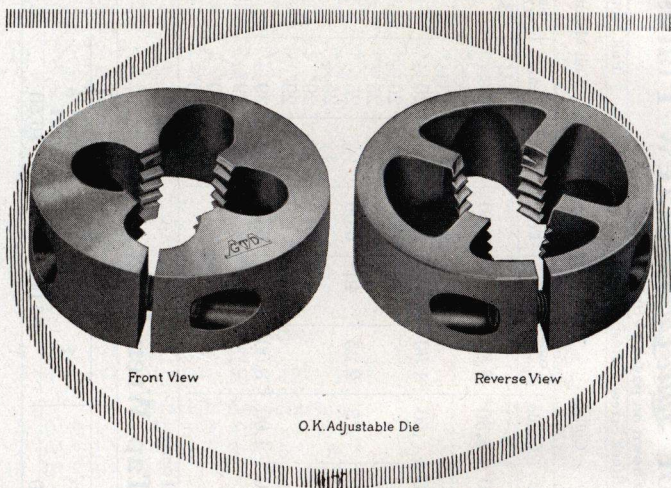
Single Stock Screw Plates				Full Mounted Screw Plates			
Cutting Size	Tap	Sets of Taps	Die	No. of Collet	Collet		Stock
					Cap	Guide	
Cutting Size	Tap	Sets of Taps	Die	No. of Collet	Cap	Guide	Complete
1/4	\$.45	\$ 1.35	\$ 1.00	No. 1 2" diam.	.50	\$.30*	\$.80
5/16	.50	1.50	1.00				
3/8	.55	1.65	1.25				
7/16	.60	1.80	1.25				
1/2	.70	2.10	1.50	No. 5 2 3/4" diam.	.80	.50	1.30
9/16	.80	2.40	1.50				
5/8	.90	2.70	1.75				
1 1/16	1.05	3.15	1.75				
3/4	1.20	3.60	2.00	No. 20 4" diam.	1.50	.75	2.25
1 1/8	1.60	4.80	2.75				
1 1/4	2.00	6.00	3.00				
1 1/2	2.25	6.75	4.00				
1 3/8	2.60	7.80	4.00	No. 25 4 1/2" diam.	2.00	1.00	3.00
1 3/4	3.00	9.00	5.00				
1 7/8	3.50	10.50	5.00				
2							
2 1/8				No. 30 5" diam.			
2 1/4							
2 1/2							
2 3/4							
3				No. 35 5 1/2" diam.			
3 1/8							
3 1/4							
3 1/2							
3 3/4				No. 40 6" diam.			
4							
4 1/8							
4 1/4							
4 1/2				No. 45 6 1/2" diam.			
4 3/4							
5							
5 1/8							
5 1/4				No. 50 7" diam.			
5 1/2							
5 3/4							
6							
6 1/8				No. 55 7 1/2" diam.			
6 1/4							
6 1/2							
6 3/4							
7				No. 60 8" diam.			
7 1/8							
7 1/4							
7 1/2							
7 3/4				No. 65 8 1/2" diam.			
8							
8 1/8							
8 1/4							
8 1/2				No. 70 9" diam.			
8 3/4							
9							
9 1/8							
9 1/4				No. 75 9 1/2" diam.			
9 1/2							
9 3/4							
10							
10 1/8				No. 80 10" diam.			
10 1/4							
10 1/2							
10 3/4							
11				No. 85 10 1/2" diam.			
11 1/8							
11 1/4							
11 1/2							
11 3/4				No. 90 11" diam.			
12							
12 1/8							
12 1/4							
12 1/2				No. 95 11 1/2" diam.			
12 3/4							
13							
13 1/8							
13 1/4				No. 100 12" diam.			
13 1/2							
13 3/4							
14							

*Bit Brace Shank Guide for No. 1 (2" diam.) Cap—50 cents.

Tap Wrenches

No.	Capacity, Inches Length, Price,	5	6	7	7 1/2	8
1	3/16-1/2		1/4-3/4	3/8-1	3/8-1 1/4	3/4-1 1/2
2	1/2-1		15	19	31	40
3	\$3.50		\$4.00	\$5.00	\$6.50	\$8.00

"OK" SCREW PLATES



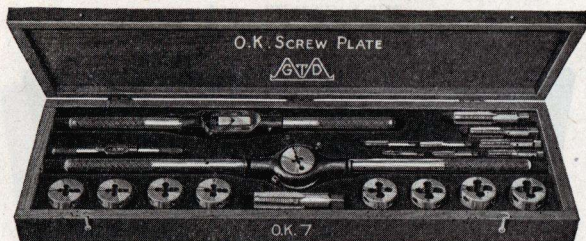
The "OK" Adjustable Round Split Die

The "OK" Die which is furnished in all "OK" Screw Plates is forged in a single piece, split through one side and spring tempered on the opposite side. It is easily adjusted by means of a single, fine pitch screw.

The forging process and heat treatment improve the quality of the steel, making it tougher and less liable to fracture. These dies hold a better cutting edge than do the round dies cut from bar stock.

Extra large chip clearance spaces make the "OK" die exceptionally free-cutting and facilitate proper lubrication.

“OK” Single Stock Screw Plates



These assortments contain taper taps and “OK” dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 34 and 35.

Repair parts for following screw plates listed on page 37.

No.	“OK” 1	“OK” 2	“OK” 5	“OK” 5½	“OK” 7	“OK” 7½
Cutting Sizes and Threads per Inch	¼-20 ⅝-18 ⅜-16 ⅞-14 ½-13	¼-20 ⅜-16 ½-13 ⅝-11 ¾-10	¼-20 ⅝-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10	¼-20 ⅝-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10	¼-20 ⅝-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10 ⅞-9 1-8	¼-20 ⅝-18 ⅜-16 ⅞-14 ½-13 ⅝-11 ¾-10 ⅞-9 1-8
Dies Diam. Inches	1½	2	2	2	2	2
Stock No.	“OK” 1	“OK” 5	“OK” 5	“OK” 5	“OK” 10	“OK” 10
Length	14"	23"	23"	23"	26"	26"
Tap Wrench No.	5	6	6	6	5, 7	5, 7
Net Wt. lbs.	6½	11½	12	15½	22	23
Price Dollars	15.50	19.50	23.50	26.00	35.50	38.00

"OK" Screw Plates

(Automobile and Other Fine Thread Purposes)

With SAE Threads



These assortments contain plug taps and "OK" dies in the cutting sizes and with threads per inch as listed below.

Repair parts for following screw plates listed on page 37.

No.	Single Stock				
	"OK" 31	"OK" 35	"OK" 35½	"OK" 37	"OK" 37½
Cutting Sizes and Threads Per Inch	¼-28	¼-28	¼-28	¼-28	¼-28
	⅝-24	⅝-24	⅝-24	⅝-24	⅝-24
	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24
	⅞-20	⅞-20	⅞-20	⅞-20	⅞-20
	½-20	½-20	½-20	½-20	½-20
			⅞-18		⅞-18
		⅝-18	⅝-18	⅝-18	⅝-18
		¾-16	¾-16	¾-16	¾-16
				⅞-14	⅞-14
				1-14	1-14
Dies Diam. Inches	1 ½	2	2	2	2
Stock No. and Length	"OK" 1 14"	"OK" 5 23"	"OK" 5 23"	"OK" 10 26"	"OK" 10 26"
Tap Wrench No.	5	6	6	5, 7	5, 7
Net Weight lbs.	6 ½	12	12 ½	22	22 ½
Price, Dollars	15.50	23.50	26.00	35.50	38.00

"OK" Screw Plates

(Automobile and Other Fine Thread Purposes)

With USS and SAE Threads



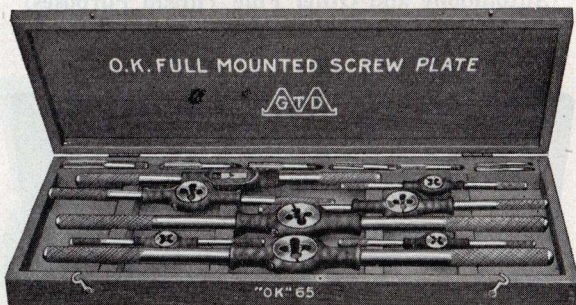
These combination assortments avoid the expense of buying extra sets of taps and dies for each thread standard and the consequent duplication of stocks and tap wrenches.

Repair parts for following screw plates listed on page 37.

No.	"OK" 310		"OK" 311		"OK" 312		"OK" 315		"OK" 317	
Form of Thread	USS	SAE	USS	SAE	USS	SAE	USS	SAE	USS	SAE
Cutting Sizes and Threads per Inch	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4 7/8 1"	1/4 5/16 3/8 7/16 1/2 9/16 5/8 3/4 7/8 1"	1/4 5/16 3/8 7/16 1/2 5/8 3/4	1/4 5/16 3/8 7/16 1/2 5/8 3/4	1/4 5/16 3/8 7/16 1/2 5/8 3/4 7/8 1"	1/4 5/16 3/8 7/16 1/2 5/8 3/4 7/8 1"
Die, Diam. Inches	1 1/2		2		2		2		2	
Stock No. and Length	"OK" 1 14"		"OK" 5 23"		"OK" 10 26"		"OK" 5 23"		"OK" 10 26"	
Tap Wrench No.	5		6		5, 7		6		5, 7	
Net Weight lbs.	6 3/4		19		24		17 1/2		23 1/2	
Price Dollars	25.00		47.50		67.00		42.50		62.00	



"OK" Full Mounted Screw Plates



These assortments contain taper taps and "OK" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 34 and 35.

Repair parts for following screw plates listed on opposite page.

No.	"OK" 61	"OK" 65	"OK" 65½	"OK" 67	"OK" 67½
Cutting Sizes and Threads per Inch	¼-20 ⅝-18 ¾-16 ⅞-14 1½-13	¼-20 ⅝-18 ¾-16 ⅞-14 1½-13 ⅝-11 ¾-10	¼-20 ⅝-18 ¾-16 ⅞-14 1½-13 ⅞-12 ⅝-11 ¾-10	¼-20 ⅝-18 ¾-16 ⅞-14 1½-13 ⅝-11 ¾-10 ⅞-9 1-8	¼-20 ⅝-18 ¾-16 ⅞-14 1½-13 ⅞-12 ⅝-11 ¾-10 ⅞-9 1-8
Tap Wrench No.	5	6	6	5, 7	5, 7
Net Weight lbs.	9	20	21	33	35
Price Dollars	18.50	28.50	33.50	46.00	51.00



“OK” Screw Plates

Condensed List

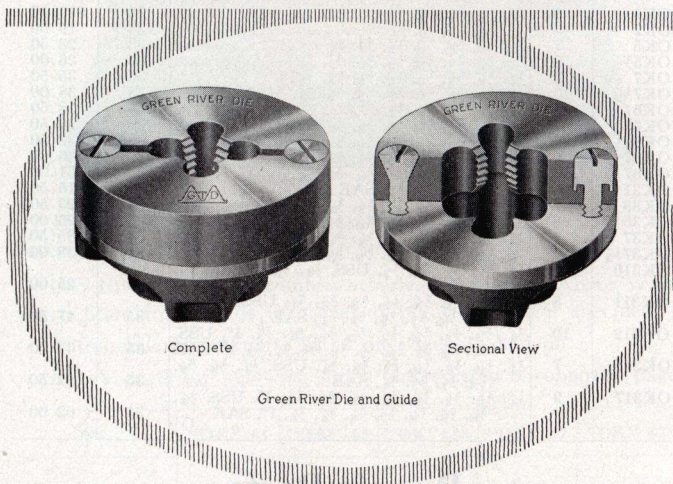
Set No.	No. Sizes	Capacity	Listed on Page	Price
Fractional				
OK1	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	33	\$15.50
OK2	5	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	33	19.50
OK5	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	33	23.50
OK5 $\frac{1}{2}$	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$	33	26.00
OK7	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$	33	35.50
OK7 $\frac{1}{2}$	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$	33	38.00
OK61	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	36	18.50
OK65	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	36	28.50
OK65 $\frac{1}{2}$	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$	36	33.50
OK67	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$	36	46.00
OK67 $\frac{1}{2}$	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$	36	51.00
OK31	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, SAE	34	15.50
OK35	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, SAE	34	23.50
OK35 $\frac{1}{2}$	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, SAE	34	26.00
OK37	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, SAE	34	35.50
OK37 $\frac{1}{2}$	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, SAE	34	38.00
OK310	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, USS, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, SAE	35	25.00
OK311	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, USS, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, SAE	35	47.50
OK312	10	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, USS, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, SAE	35	67.00
OK315	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, USS, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, SAE	35	42.50
OK317	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, USS, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1''$, SAE	35	62.00

Repair Parts for “OK” Screw Plates

Shown on pages 33 to 36

Cutting Size	Tap	Die			Adj. Guide Stock		Stocks with Guides for “OK” Full Mounted Screw Plates			
		1" Diam.	1 $\frac{1}{2}$ " Diam.	2" Diam.	Number	Price	No.	Diam. of Die	Cutting	Price
$\frac{1}{4}$	\$.45	\$.75	\$1.25	\$2.00	No. “OK” 1 (1 $\frac{1}{2}$ " diam.) No. “OK” 5 (2" diam.) No. “OK” 10 (2" diam.)	\$3.00 \$3.50 \$4.00	1	1"	$\frac{1}{4}$ "	\$1.00
$\frac{5}{16}$	.50	.75	1.25	2.00			1 $\frac{1}{2}$	1 $\frac{1}{2}$ "	$\frac{5}{16}$ "
$\frac{3}{8}$	.55	.75	1.25	2.00			2	2"	$\frac{3}{8}$ "
$\frac{7}{16}$	.60		1.25	2.00			2	2"	$\frac{7}{16}$ "
$\frac{1}{2}$	.70		1.25	2.00			2	2"	$\frac{1}{2}$ "
$\frac{9}{16}$	.80		1.25	2.00			2	2"	$\frac{9}{16}$ "
$\frac{5}{8}$	.90		1.25	2.00			2	2"	$\frac{5}{8}$ "
$\frac{3}{4}$	1.20			2.00			3	2"	$\frac{3}{4}$ "	
$\frac{7}{8}$	1.60			2.00					$\frac{7}{8}$ "	2.25
1	2.00			2.25					1"	

GREEN RIVER SCREW PLATES



Complete

Sectional View

Green River Die and Guide

The "*Green River*" die is a round, two-piece die, extremely simple in construction, requiring no collet.

The die is fastened to a base which forms a guide for the work to be cut.

The two halves of the die are hinged together by a cup-head screw, which, with the taper-head adjusting screw, holds the die and guide together.

The die may be adjusted to size, without removal from stock or holder, by turning the taper-head screw in, to open, and out, to close.

While "*Green River*" dies are intended to cut from the side next the guide, they are also slightly chamfered on the face side to enable them to cut close to shoulder.

These dies are used in all "*Green River*" screw plates shown on following pages. Sizes, threads and prices listed on pages 136 and 137.

GREEN RIVER Screw Plates

Single Stock



These assortments contain plug taps and "Green River" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered.* Whitworth Standard threads furnished at regular prices if specified.*

Automobile assortments listed on pages 42 and 43.

Repair parts for following screw plates listed on page 45.

No.	Machine Screw			Fractional		
	151	153	155	152	154	156
Cutting Sizes and Threads per Inch			2-56			
			3-48			
	4-36	4-36	4-36		$\frac{1}{16}$ -64	
			5-36		$\frac{5}{64}$ -60	
	6-32	6-32	6-32		$\frac{3}{32}$ -50	
	8-32	8-32	8-32	$\frac{7}{64}$ -48	$\frac{1}{8}$ -48	
	10-24	10-24	10-24	$\frac{1}{8}$ -40	$\frac{1}{8}$ -40	$\frac{1}{8}$ -40
		10-32	10-32	$\frac{9}{64}$ -40	$\frac{9}{64}$ -40	
	12-24	12-24	12-24	$\frac{5}{32}$ -36	$\frac{5}{32}$ -36	$\frac{5}{32}$ -36
		14-20	14-20			
				$\frac{3}{16}$ -24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24
				$\frac{7}{32}$ -24	$\frac{7}{32}$ -24	$\frac{7}{32}$ -24
				$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20
Guides Diam. Inches	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
Stock No. and Length	1800 6"					
Tap Wrenches No.	329					
Net Weight lbs.	2½	2½	3½	3	3½	2½
Price Dollars	10.50	13.50	18.00	13.50	18.00	10.50

* On fractional sizes only.



GREEN RIVER Screw Plates

Single Stock



These assortments contain taper taps and "Green River" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 42 and 43.

Repair parts for following screw plates listed on page 45.

No.	5000*	5001	5002	5004	5005	5005½
Cutting Sizes and Threads per Inch	$\frac{3}{16}$ -24 $\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13	$\frac{1}{4}$ -20 $\frac{3}{8}$ -16 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10	$\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{9}{16}$ -12 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10
Guides Diam. Inches	1½	1½	2 $\frac{3}{16}$	2¾	2 $\frac{3}{16}$	2 $\frac{3}{16}$
Stock No. and Length	1801½ 15"	1801½ 15"	1803 22"	1805 29"	1803 22"	1803 22"
Tap Wrench No.	5	5	6	7	6	6
Net Wt. lbs.	9	8	11	25½	16	17
Price Dollars	20.00	18.00	22.75	29.25	27.50	30.75

* No. 5000 has plug tap for $\frac{3}{16}$ size.

GREEN RIVER Screw Plates

Single and Two Stock



These assortments contain taper taps and "Green River" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. Whitworth Standard threads furnished at regular prices if specified.

Automobile assortments listed on pages 42 and 43.

Repair parts for following screw plates listed on page 45.

No.	Single Stock			Two Stock		
	5006	5007	5025	5009	5040	5050
Cutting Sizes and Threads per Inch	$\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8 $\frac{7}{8}$ -9 1-8 $1\frac{1}{8}$ -7 $1\frac{1}{4}$ -7 $1\frac{3}{8}$ -6 $1\frac{1}{2}$ -6	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8 $\frac{7}{8}$ -9 1-8 $1\frac{1}{8}$ -7 $1\frac{1}{4}$ -7	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8 $\frac{7}{8}$ -9 1-8 $1\frac{1}{8}$ -7 $1\frac{1}{4}$ -7 $1\frac{3}{8}$ -6 $1\frac{1}{2}$ -6	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8 $\frac{7}{8}$ -9 1-8 $1\frac{1}{8}$ -7 $1\frac{1}{4}$ -7 $1\frac{3}{8}$ -6 $1\frac{1}{2}$ -6
Dies & Guides Diam. Inches	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3 $\frac{7}{16}$	1 $\frac{1}{2}$ 2 $\frac{3}{4}$	2 $\frac{3}{16}$ 2 $\frac{3}{4}$	2 $\frac{3}{16}$ 3 $\frac{7}{16}$
Stock No. and Length	1805 29"	1805 29"	1807 50"	1801 $\frac{1}{2}$ 15" 1805 29"	1802 18" 1806 35"	1803 22" 1807 50"
Tap Wrench No.	7	5, 7	8	5, 7	5, 7 $\frac{1}{2}$	6, 8
Net Weight lbs.	24	27	63	27 $\frac{1}{2}$	44	72
Price Dollars	35.00	42.00	70.00	43.50	68.50	92.00

No. 5009 has 1 $\frac{1}{2}$ " guide for sizes $\frac{7}{16}$ " and smaller, 2 $\frac{3}{4}$ " for $\frac{1}{2}$ " and larger.

No. 5040 has 2 $\frac{3}{16}$ " guide for sizes $\frac{7}{16}$ " and smaller, 2 $\frac{3}{4}$ " for $\frac{1}{2}$ " and larger.

No. 5050 has 2 $\frac{3}{16}$ " guide for sizes $\frac{3}{4}$ " and smaller and $\frac{5}{16}$ " for $\frac{7}{8}$ " and larger.



GREEN RIVER Screw Plates

(Automobile and Other Fine Thread Purposes)

With SAE Threads



These assortments furnished with plug taps, "Green River" dies and guides in the cutting sizes and with threads per inch as listed below.

Repair parts for following assortments listed on page 45.

No.	5031	5035	5037 $\frac{1}{2}$
Cutting Sizes and Threads per Inch	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{5}{8}$ -18 $\frac{3}{4}$ -16	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{9}{16}$ -18 $\frac{5}{8}$ -18 $\frac{3}{4}$ -16 $\frac{7}{8}$ -14 1-14
Dies & Guides Diam. Inches	$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{16}$
Stock No. and Length	1802 18"	1803 22"	1803 22"
Tap Wrench No.	5	6	5, 7
Net Weight lbs.	11	16	27
Price Dollars	18.50	27.50	44.25

GREEN RIVER Screw Plates

(Automobile and Other Fine Thread Purposes)

With Combination USS and SAE Threads



These assortments contain taper taps, USS; and plug taps SAE; "Green River" dies in the cutting size and with threads per inch as listed below. Die holders with bit brace shanks also furnished as regular with combination sets. Repair parts for following sets listed on page 45.

No.	5310		5311		5312	
	USS	SAE	USS	SAE	USS	SAE
Cutting Sizes and Threads per Inch	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{9}{16}$ -12 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{9}{16}$ -18 $\frac{5}{8}$ -18 $\frac{3}{4}$ -16	$\frac{1}{4}$ -20 $\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14 $\frac{1}{2}$ -13 $\frac{9}{16}$ -12 $\frac{5}{8}$ -11 $\frac{3}{4}$ -10 $\frac{7}{8}$ -9 1-8	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{9}{16}$ -18 $\frac{5}{8}$ -18 $\frac{3}{4}$ -16 $\frac{7}{8}$ -14 1-14
Dies & Guides Diam. Inches	$2\frac{3}{16}$		$2\frac{3}{16}$		$2\frac{3}{16}$	
Stock No. and Length	1802 18"		1803 22"		1803 $\frac{1}{2}$ 29"	
Tap Wrench No.	5		6		5, 7	
Net Weight lbs.	18		37		41	
Price Dollars	29.25		56.00		79.00	



GREEN RIVER Screw Plates

Condensed List

Set No.	No. Sizes	Capacity	Listed on Page	Price
Fractional				
152	7	$\frac{7}{64}, \frac{1}{8}, \frac{9}{64}, \frac{5}{32}, \frac{3}{16}, \frac{7}{32}, \frac{1}{4}$	39	\$13.50
154	10	$\frac{1}{16}, \frac{5}{64}, \frac{3}{32}, \frac{7}{64}, \frac{1}{8}, \frac{9}{64}, \frac{5}{32}, \frac{3}{16}, \frac{7}{32}, \frac{1}{4}$..	39	18.00
156	5	$\frac{1}{8}, \frac{5}{32}, \frac{3}{16}, \frac{7}{32}, \frac{1}{4}$	39	10.50
5000	6	$\frac{3}{16}, \frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}$	40	20.00
5001	5	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}$	40	18.00
5002	5	$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}$	40	22.75
5004	5	$\frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1"$	40	29.25
5005	7	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}$	40	27.50
5005 $\frac{1}{2}$	8	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}$	40	30.75
5006	7	$\frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1"$	41	35.00
5007	9	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1"$	41	42.00
5009	9	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1"$	41	43.50
5025	6	$\frac{7}{8}, 1, 1\frac{1}{8}, 1\frac{1}{4}, 1\frac{3}{8}, 1\frac{1}{2}$	41	70.00
5031	5	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \text{SAE}$	42	18.50
5035	7	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \text{SAE}$	42	27.50
5037 $\frac{1}{2}$	10	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1" \text{ SAE}$..	42	44.25
5040	11	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1, 1\frac{1}{8}, 1\frac{1}{4}$..	41	68.50
5050	13	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1, 1\frac{1}{8}, 1\frac{1}{4},$ $1\frac{3}{8}, 1\frac{1}{2}$	41	92.00
5310	5	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \text{USS } \frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2},$ SAE	43	29.25
5311	8	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}, \text{USS}, \frac{1}{4}, \frac{5}{16},$ $\frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}, \text{SAE}$	43	56.00
5312	10	$\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1, \text{USS},$ $\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1,$ SAE	43	79.00
Machine Screw				
151	5	$4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}$	39	10.50
153	7	$4^{36}, 6^{32}, 8^{32}, 10^{24}, 10^{32}, 12^{24}, 14^{20}$	39	13.50
155	10	$2^{56}, 3^{48}, 4^{36}, 5^{36}, 6^{32}, 8^{32}, 10^{24}, 10^{32}, 12^{24},$ $14^{20}, 16^{18}$	39	18.00
International Standard				
5041	5	$6^{1.00}, 7^{1.00}, 8^{1.25}, 10^{1.50}, 12^{1.75}$	68	18.50
5045	7	$6^{1.00}, 8^{1.25}, 10^{1.50}, 12^{1.75}, 14^{2.00}, 16^{2.00},$ $18^{2.50}$	68	27.50
5047	9	$6^{1.00}, 8^{1.25}, 10^{1.50}, 12^{1.75}, 14^{2.00}, 16^{2.00},$ $18^{2.50}, 20^{2.50}, 24^{3.00}$	68	42.00



Repair Parts for GREENRIVER Screw Plates

Shown on pages 39 to 43

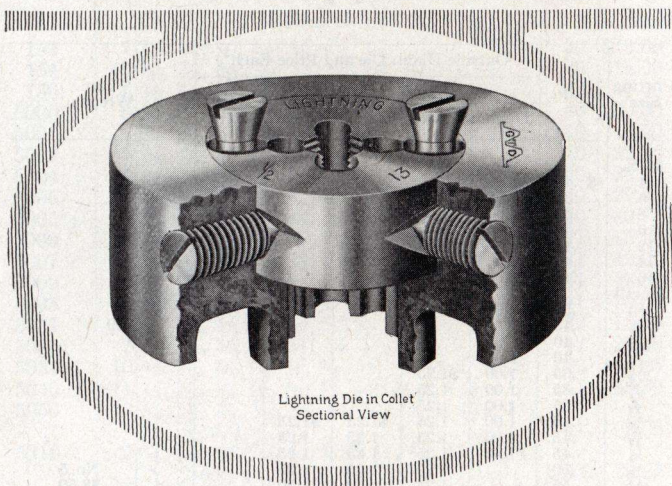
Cutting Size	Tap	Outside Diam. Die and Price Each					Tap Wrench
		$\frac{7}{8}$ " Diam.	$1\frac{1}{2}$ " Diam.	$2\frac{3}{16}$ " Diam.	$2\frac{3}{4}$ " Diam.	$3\frac{7}{16}$ " Diam.	
M. S.		†		*			
4	\$.40	\$1.00					
6	.35	1.00					
8	.35	1.00					
10	.40	1.00					
12	.45	1.00					
14	.45	1.00					
16	.45	1.00					
Fract'l							
$\frac{1}{16}$	.50	1.00					
$\frac{3}{16}$	.45	1.00					
$\frac{1}{4}$	.40	1.00					No. 329 \$.50
$\frac{5}{16}$	.40	1.00					
$\frac{3}{8}$	.35	1.00	\$1.25				
$\frac{7}{16}$	.35	1.00	1.25				
$\frac{1}{2}$	.35	1.00	1.25				
$\frac{5}{8}$	.40	1.00	1.25	\$1.25	\$1.25		
$\frac{3}{4}$	.45	1.00	1.25	1.25	1.25		
$\frac{7}{8}$	.45	1.00	1.25	1.25	1.25		
$\frac{1}{4}$	.50	...	1.25	1.25	1.25		
$\frac{5}{16}$	.55	...	1.25	1.50	1.50		No. 5 \$3.50
$\frac{3}{8}$	.60	...	1.25	1.50	1.50		
$\frac{7}{16}$	.70	...	1.25	1.50	1.50		No. 6 \$4.00
$\frac{1}{2}$	.80	...	...	1.60	1.60		No. 7 \$5.00
$\frac{5}{8}$	.90	...	...	1.75	1.75		
$\frac{3}{4}$	1.05	...	...	1.90	1.90		
$\frac{7}{8}$	1.20	...	...	2.00	2.00		
$\frac{1}{4}$	1.60	...	...	2.50	2.50	\$2.50	
1	2.00	...	2.00	3.00	3.00	3.00	
$1\frac{1}{8}$	2.25	...	...	...	3.50	3.50	No. 7 1/2 \$6.50
$1\frac{1}{4}$	2.60	...	...	...	4.00	4.00	No. 8 \$8.00
$1\frac{3}{8}$	3.00	...	...	...	...	4.50	
$1\frac{1}{2}$	3.50	...	...	...	...	5.00	
Stock Guide		1.25 †	2.25 .70	3.00 1.00	3.50 1.00	6.00 1.50	

† Price includes guide. Not furnished separately.

* A bit brace guide for use with $2\frac{3}{16}$ " diameter dies can be furnished. Price \$2.75.

LIGHTNING

SCREW PLATES



Lightning Die in Collet
Sectional View

The ***LIGHTNING*** Die and Collet

The "Lightning" die is a round, two-piece die, supplied with its collet for use in the single die stock, or without collet when used in full mounted stocks.

The die is secured in the collet or the stock by means of two interior taper head screws and four exterior set screws.

Loosening the set screws and removing the taper head screws permit the die to be removed for sharpening.

Adjustment is effected and maintained by turning the interior screws, checking the die halves against them by means of the set screws in the side.

The lower half of the collet forms a guide for the die, insuring its being started squarely on the bar.

LIGHTNING Screw Plates

Single Stock



These assortments contain taper taps and "Lightning" dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

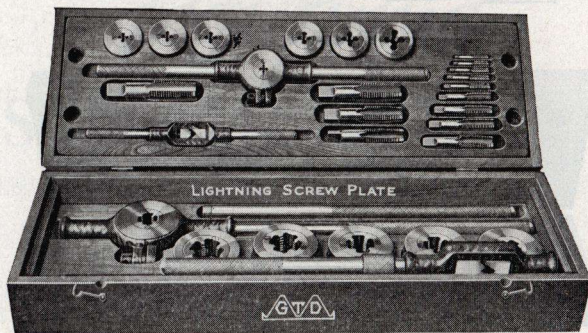
Repair parts for following screw plates listed on page 51.

No.	8000*	8001	8002	8004	8005	8005½
Cutting Sizes and Threads per Inch	⅜-24					
	¼-20	¼-20	¼-20		¼-20	¼-20
	⅝-18	⅝-18			⅝-18	⅝-18
	⅜-16	⅜-16	⅜-16		⅜-16	⅜-16
	⅞-14	⅞-14			⅞-14	⅞-14
	½-13	½-13	½-13	½-13	½-13	½-13
			⅝-11	⅝-11	⅝-11	⅝-11
			¾-10	¾-10	¾-10	¾-10
				⅞-9 1-8		
Collets Diam. Inches	2⅜	2⅜	2¾	2¾	2¾	2¾
Stock No. and Length	1802 18"	1802 18"	1804 23"	1805 29"	1804 23"	1804 23"
Tap Wrench No.	5	5	6	7	6	6
Net Wt. lbs.	10	9½	16½	21	19	23
Price Dollars	20.00	18.50	22.75	29.25	27.50	30.75

*No. 8000 has plug tap for ⅜ size.



LIGHTNING Screw Plates



Single and two stock screw plates with taper taps and also assortments with taper, plug and bottoming taps listed below.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

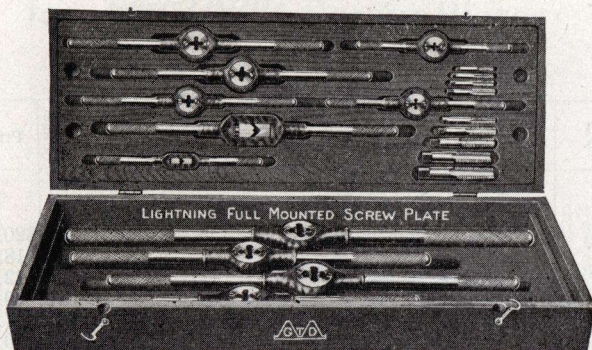
Repair parts for following screw plates listed on page 51.

No.	Single Stock			Two Stock		Single Stock Taper, Plug and Bottoming		
	8006	8007	8025	8009	8050	8101	8105	8107
Cutting Sizes and Threads per Inch	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20		$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20
	$\frac{5}{16}$ -18	$\frac{5}{16}$ -18		$\frac{5}{16}$ -18	$\frac{5}{16}$ -18	$\frac{5}{16}$ -18	$\frac{5}{16}$ -18	$\frac{5}{16}$ -18
	$\frac{3}{8}$ -16	$\frac{3}{8}$ -16		$\frac{3}{8}$ -16	$\frac{3}{8}$ -16	$\frac{3}{8}$ -16	$\frac{3}{8}$ -16	$\frac{3}{8}$ -16
	$\frac{7}{16}$ -14	$\frac{7}{16}$ -14		$\frac{7}{16}$ -14	$\frac{7}{16}$ -14	$\frac{7}{16}$ -14	$\frac{7}{16}$ -14	$\frac{7}{16}$ -14
	$\frac{1}{2}$ -13	$\frac{1}{2}$ -13		$\frac{1}{2}$ -13	$\frac{1}{2}$ -13	$\frac{1}{2}$ -13	$\frac{1}{2}$ -13	$\frac{1}{2}$ -13
	$\frac{5}{8}$ -11	$\frac{5}{8}$ -11		$\frac{5}{8}$ -11	$\frac{5}{8}$ -11		$\frac{5}{8}$ -11	$\frac{5}{8}$ -11
	$\frac{3}{4}$ -10	$\frac{3}{4}$ -10		$\frac{3}{4}$ -10	$\frac{3}{4}$ -10		$\frac{3}{4}$ -10	$\frac{3}{4}$ -10
	$\frac{7}{8}$ -9	$\frac{7}{8}$ -9	$\frac{7}{8}$ -9	$\frac{7}{8}$ -9	$\frac{7}{8}$ -9		$\frac{7}{8}$ -9	$\frac{7}{8}$ -9
	1-8	1-8	1-8	1-8	1-8		1-8	1-8
			$1\frac{1}{8}$ -7		$1\frac{1}{8}$ -7			
Collets Diam. Inches			$\frac{1}{4}$ -7		$\frac{1}{4}$ -7			
			$\frac{5}{16}$ -6		$\frac{5}{16}$ -6			
			$\frac{3}{8}$ -6		$\frac{3}{8}$ -6			
			$\frac{1}{2}$ -6		$\frac{1}{2}$ -6			
Stock No. and Length	2 $\frac{3}{4}$	2 $\frac{3}{4}$	4 $\frac{1}{4}$	2 $\frac{3}{16}$	2 $\frac{3}{4}$	2 $\frac{3}{16}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$
	1805	1805	1809	1802	1804	1802	1804	1805
	29"	29"	53"	1805	1809	18"	23"	29"
				29"	53"			
Tap Wrench No.	7	5, 7	8	5, 7	6, 8	5	6	5, 7
Net Weight lbs.	27	28	76	30	95	12	24	35
Price Dollars	35.00	42.00	70.00	43.50	92.00	22.00	35.75	50.50

No. 8009 contains 2 $\frac{3}{16}$ " collets for sizes $\frac{1}{16}$ " and smaller and 2 $\frac{3}{4}$ " collets for sizes $\frac{1}{2}$ " and larger.

No. 8050 contains 2 $\frac{3}{4}$ " collets for sizes $\frac{3}{4}$ " and smaller and 4 $\frac{1}{4}$ " collets for sizes $\frac{1}{8}$ " and larger.

LIGHTNING Full Mounted Screw Plates



These full mounted assortments provide a separate stock for each cutting size.

USS threads furnished unless otherwise ordered. SAE or Whitworth Standard threads furnished at regular prices if specified.

Repair parts for following screw plates listed on page 51.

No.	8061	8065	8065 1/2	8067
Cutting Sizes and Threads per Inch	1/4-20	1/4-20	1/4-20	1/4-20
	5/16-18	5/16-18	5/16-18	5/16-18
	3/8-16	3/8-16	3/8-16	3/8-16
	7/16-14	7/16-14	7/16-14	7/16-14
	1/2-13	1/2-13	1/2-13	1/2-13
		5/8-11	5/8-11	5/8-11
		3/4-10	3/4-10	3/4-10
			9/16-12	7/8-9
				1-8
Tap Wrench No.	5	6	6	5, 7
Net Weight lbs.	16	23	31	46
Price Dollars	22.00	34.50	38.50	54.00

LIGHTNING* Screw Plates*Condensed List**

Set No.	No. Sizes	Capacity	Listed on Page	Price
Fractional				
8000	6	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	47	\$20.00
8001	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	47	18.50
8002	5	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	47	22.75
8004	5	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	47	29.25
8005	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	47	27.50
8005 $\frac{1}{2}$	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$	47	30.75
8006	7	$\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	48	35.00
8007	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	48	42.00
8009	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	48	43.50
8025	6	$\frac{7}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	48	70.00
8050	13	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	48	92.00
8061	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	49	22.00
8065	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	49	34.50
8065 $\frac{1}{2}$	8	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$	49	38.50
8067	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	49	54.00
8101	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	48	22.00
8105	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	48	35.75
8107	9	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1"$	48	50.50
International Standard				
8041	5	61.00, 71.00, 81.25, 101.50, 121.75	66	18.50
8045	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	66	27.50
8047	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	66	42.00
8461	5	61.00, 71.00, 81.25, 101.50, 121.75	67	22.00
8465	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	67	34.50
8467	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	67	54.00
8401	5	61.00, 71.00, 81.25, 101.50, 121.75	66	22.00
8405	7	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50	66	35.75
8407	9	61.00, 81.25, 101.50, 121.75, 142.00, 162.00, 182.50, 202.50, 243.00	66	50.50



Repair Parts

for ***LIGHTNING*** Screw Plates

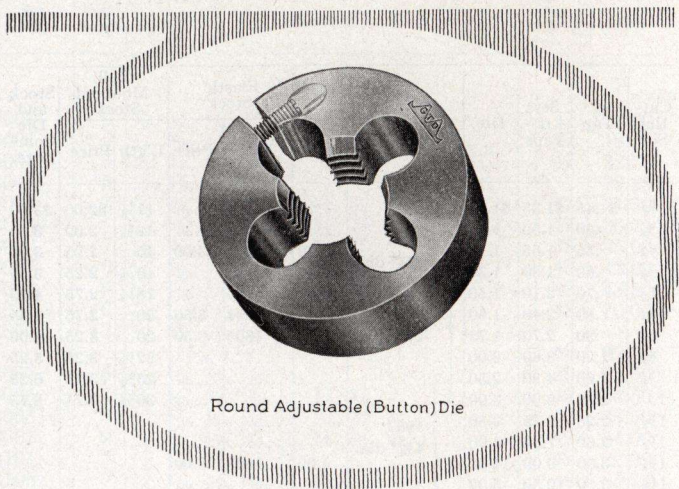
Shown on pages 47 to 49

Cut- ting Size	Tap	Sets of Taps	Die	Collet		Elastic Stock		Full Mounted Stock		Stock and Die Com- plete
				No.	Price	No.	Price	L'gth	Price	
1/4	\$.45	\$1.35	\$1.00	1955 2 3/16" dia.	.....	.....	.....	11 1/4	\$2.00	\$3.00
5/16	.50	1.50	1.00		.....	.....	.....	12 3/4	2.00	3.00
3/8	.55	1.65	1.15		\$1.50	1802	\$3.00	15	2.25	3.40
7/16	.60	1.80	1.30		.....	.....	.....	16 7/8	2.25	3.55
1/2	.70	2.10	1.50	1956 2 3/4" dia.	.....	.....	.....	18 1/4	2.75	4.25
5/8	.80	2.40	1.60		1.50	1804	3.50	20	2.75	4.35
3/4	.90	2.70	1.75		.....	1805	3.50	20	3.25	5.00
7/8	1.20	3.60	2.00		.....	.....	.....	22 1/2	3.25	5.25
1	1.60	4.80	2.50	1957 4 1/4" dia.	.....	.....	.....	25 3/4	3.75	6.25
1 1/8	2.00	6.00	3.00		.....	.....	.....	30 3/4	3.75	6.75
1 1/4	2.25	6.75	3.50		.....	.....	.....	.....	.....	.....
1 1/4	2.60	7.80	4.00		.....	.....	.....	.....	.....	.....
1 3/8	3.00	9.00	4.50	.....	4.00	1809	8.00	.....	.....	.....
1 1/2	3.50	10.50	5.00		.....	.....	.....	.....	.....	.....

Tap Wrenches

No.	Capacity	Length	Price
5	3/16 to 1/2	11"	\$3.50
6	1/4 to 3/4	15"	4.00
7	3/8 to 1	19"	5.00
8	3/4 to 1 1/2	40"	8.00

“BUTTON” DIE SCREW PLATES



Round Adjustable (Button) Die

The GTD Adjustable Round Die

The GTD Adjustable Round Split Die is made from a solid piece of steel, carefully hobbed, split on one side to provide means of adjusting, and spring tempered on the opposite side.

Adjustment is accomplished by means of a fine pitch screw in the split side which forces the teeth away from the center, or allows them to spring together.

Abundant chip room is provided in the large clearance holes back of the lands.

“Button” Die Screw Plates



These assortments contain plug taps and “Button” dies in the cutting sizes and with threads per inch as listed below.

USS threads furnished unless otherwise ordered. Whitworth Standard threads furnished at regular prices if specified. Automobile assortments listed on pages 54 and 55. Repair parts for following screw plates listed on page 57.

No.	Machine Screw				Fractional Sizes					
	D-5	D-6	D-7	D-10	DD5	DD6	DD7	DD8	F-5	F-6
Cutting Sizes and Threads per Inch				2-56 3-48				$\frac{1}{16}$ -64 $\frac{3}{32}$ -50		
	4-36	4-36	4-36	4-36	$\frac{1}{8}$ -40	$\frac{7}{64}$ -48	$\frac{7}{64}$ -48	$\frac{7}{64}$ -48		
				5-36	$\frac{1}{8}$ -40	$\frac{1}{8}$ -40	$\frac{1}{8}$ -40	$\frac{1}{8}$ -40		$\frac{1}{8}$ -40
	6-32	6-32	6-32	6-32						
	8-32	8-32	8-32	8-32	$\frac{5}{32}$ -36	$\frac{5}{32}$ -36	$\frac{5}{32}$ -36	$\frac{5}{32}$ -36		
	10-24	10-24	10-24	10-24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24	$\frac{3}{16}$ -24
				10-32	$\frac{7}{32}$ -24	$\frac{7}{32}$ -24	$\frac{7}{32}$ -24	$\frac{7}{32}$ -24		
	12-24	12-24	12-24	12-24	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20	$\frac{1}{4}$ -20
		14-20	14-20	14-20					$\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14	$\frac{5}{16}$ -18 $\frac{3}{8}$ -16 $\frac{7}{16}$ -14
Dies, Diam. Inches	$\frac{13}{16}$				$\frac{13}{16}$				1	
Stock No. and Length	“D” $6\frac{1}{4}$ ”				“D” $6\frac{1}{4}$ ”				“F” 9”	
Tap Wrench No.	340				340				4	
Net Weight lbs.	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$
Price Dollars	8.00	9.00	10.00	13.00	8.00	9.00	10.00	11.00	11.00	12.25



"Button" Die Screw Plates

(Automobile and Other Fine Thread Purposes)

In Leather Rolls with SAE Threads



These assortments furnished with SAE standard threads, contain the sizes especially suited for automobile and garage repair work. Nos. 1470, 1471 may be had in wood boxes at same prices. No. C-300 packed in wood box.

Repair parts for following screw plates listed on page 57.

No.	1470	1471	1475	C-300
Cutting Size and Threads per Inch	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{9}{16}$ -18 $\frac{5}{8}$ -18	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20 $\frac{9}{16}$ -18 $\frac{5}{8}$ -18	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20*	$\frac{1}{4}$ -28 $\frac{5}{16}$ -24 $\frac{3}{8}$ -24 $\frac{7}{16}$ -20 $\frac{1}{2}$ -20*
Dies Diam. Inches	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	1
Stock No. and Length	1853 14"	1853 14"	1852 9"	1852 9"
Tap Wrenches No.	—	6	333	—
Net Weight lbs.	3 $\frac{3}{4}$	6	3	1 $\frac{1}{2}$
Price Dollars	20.00	23.00	13.00	9.00

* $\frac{1}{2}$ -20 Dies, 1" in diameter are special and when bought as repairs, special prices apply.

"Button" Die Screw Plates

(Automobile and Other Fine Thread Purposes)
With Combination Machine Screw USS and SAE Threads



These assortments are recommended for garage repairs on Ford cars, for bicycle, motorcycle and all general repair work.

Contained in varnished hard wood cases with a separate compartment for each tool.

Repair parts for following screw plates listed on page 57.

No.	2500 *		2501†	2503		2510‡
	Mach. Screw	Fractional	Fractional	Mach. Screw	USS SAE	Special for bicycle and motorcycle repairing
Cutting Sizes and Threads per Inch	6-32	$\frac{7}{32}$ -32		2-56	$\frac{3}{16}$ -24	$\frac{3}{16}$ -32
	10-24	$\frac{1}{4}$ -20	$\frac{1}{4}$ -28	3-48	$\frac{1}{4}$ -20	$\frac{1}{4}$ -25
	10-32	$\frac{5}{16}$ -18 $\frac{5}{16}$ -24	$\frac{5}{16}$ -24	4-36	$\frac{5}{16}$ -18	$\frac{5}{16}$ -24
	12-24	$\frac{3}{8}$ -16 $\frac{3}{8}$ -24	$\frac{3}{8}$ -24	6-32	$\frac{3}{8}$ -16	$\frac{3}{8}$ -24
	14-24	$\frac{13}{32}$ -16*	$\frac{13}{32}$ -16*	8-32	$\frac{7}{16}$ -14	$\frac{7}{16}$ -20
		$\frac{7}{16}$ -14 $\frac{7}{16}$ -20	$\frac{7}{16}$ -14 $\frac{7}{16}$ -20	10-24	$\frac{1}{2}$ -13	$\frac{1}{2}$ -20
		$\frac{1}{2}$ -20*	$\frac{1}{2}$ -20*	12-24	$\frac{9}{16}$ -18	$\frac{9}{16}$ -20 R.H.
				14-20	$\frac{5}{8}$ -18	$\frac{5}{8}$ -20 L.H.
				16-18		
				18-18		
Dies, Diam. Inches	$\frac{13}{16}$ " for Sizes $\frac{5}{16}$ " and smaller 1" for $\frac{3}{8}$ " and larger		1"	$\frac{13}{16}$ " for Sizes up to No. 14 and $\frac{1}{4}$ " 1 $\frac{1}{2}$ " for Sizes $\frac{5}{16}$ " to $\frac{3}{8}$ "		1" for Sizes up to $\frac{3}{8}$ " 1 $\frac{1}{2}$ " for $\frac{3}{16}$ " Sizes
Stock No. and Length	1851, 1852 6 $\frac{1}{4}$, 9		1852 9	1851, 1853 6 $\frac{1}{4}$, 14		1852, 1853 9, 14
Tap Wrench, No.	329, 333		333	329, 5		5
Net Wt. lbs.	2 $\frac{1}{2}$		4 $\frac{1}{2}$	11 $\frac{3}{4}$		10
Price Dollars	26.00		17.00	42.00		21.50

* No. 2500 regularly furnished in leather roll, but may be had in wooden box at same price.

† No. 2501 contains two reamers one "2 in 1" for Ford spindle body (part No. 2713) and spindle arm bushing (part No. 2714), and one for Ford piston pin bushing (part No. 3022 $\frac{1}{2}$).

‡ No. 2510 contains one each Taper and Plug Tap for each size. Repairs for this screw plate are special and special prices apply.

* $\frac{13}{32}$ -16 Taps and Dies and $\frac{1}{2}$ -20 Dies 1" in diameter are special and when bought as repairs, special prices apply.



“Button” Die Screw Plates

Condensed List

Set No.	No. Sizes	Capacity	Listed on Page	Price
Fractional				
DD-5	5	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	53	\$8.00
DD-6	6	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	53	9.00
DD-7	7	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	53	10.00
DD-8	8	$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$	53	11.00
KK-5	5	With drills,—otherwise same as DD-5	76	9.00
KK-7	7	With drills,—otherwise same as DD-7	76	11.50
KK-8	8	With drills,—otherwise same as DD-8	76	12.75
F5	5	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$	53	11.00
F6	6	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$	53	12.25
1470	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, SAE	54	20.00
1471	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, SAE	54	23.00
1475	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ SAE	54	13.00
2500	16	$\frac{6}{32}$, $\frac{10}{32}$, $\frac{10}{32}$, $\frac{12}{32}$, $\frac{14}{32}$, $\frac{14}{32}$, $\frac{16}{32}$, $\frac{18}{32}$, $\frac{20}{32}$, $\frac{22}{32}$, $\frac{24}{32}$, $\frac{26}{32}$, $\frac{28}{32}$, $\frac{30}{32}$, $\frac{32}{32}$	55	26.00
2501	7	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, SAE	55	17.00
C-300	5	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, SAE	54	9.00
2510	8	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, SAE	55	21.50
2503	23	$\frac{2}{32}$, $\frac{3}{32}$, $\frac{4}{32}$, $\frac{5}{32}$, $\frac{6}{32}$, $\frac{7}{32}$, $\frac{8}{32}$, $\frac{9}{32}$, $\frac{10}{32}$, $\frac{11}{32}$, $\frac{12}{32}$, $\frac{13}{32}$, $\frac{14}{32}$, $\frac{15}{32}$, $\frac{16}{32}$, $\frac{17}{32}$, $\frac{18}{32}$, $\frac{19}{32}$, $\frac{20}{32}$, $\frac{21}{32}$, $\frac{22}{32}$, $\frac{23}{32}$	55	42.00
Machine Screw				
D-5	5	$\frac{4}{32}$, $\frac{6}{32}$, $\frac{8}{32}$, $\frac{10}{32}$, $\frac{12}{32}$	53	8.00
D-6	6	$\frac{4}{32}$, $\frac{6}{32}$, $\frac{8}{32}$, $\frac{10}{32}$, $\frac{12}{32}$, $\frac{14}{32}$	53	9.00
D-7	7	$\frac{4}{32}$, $\frac{6}{32}$, $\frac{8}{32}$, $\frac{10}{32}$, $\frac{12}{32}$, $\frac{14}{32}$, $\frac{16}{32}$	53	10.00
D-10	10	$\frac{2}{32}$, $\frac{3}{32}$, $\frac{4}{32}$, $\frac{5}{32}$, $\frac{6}{32}$, $\frac{7}{32}$, $\frac{8}{32}$, $\frac{9}{32}$, $\frac{10}{32}$, $\frac{11}{32}$, $\frac{12}{32}$, $\frac{13}{32}$, $\frac{14}{32}$, $\frac{15}{32}$, $\frac{16}{32}$, $\frac{17}{32}$, $\frac{18}{32}$, $\frac{19}{32}$, $\frac{20}{32}$, $\frac{21}{32}$, $\frac{22}{32}$, $\frac{23}{32}$, $\frac{24}{32}$	53	13.00
K-5	5	With drills,—otherwise same as D-5	76	9.00
K-7	7	With drills,—otherwise same as D-7	76	11.50
K-10	10	With drills,—otherwise same as D-10	76	12.75
British Association				
D-04	5	01.0, 1.9, 2.81, 3.73, 4.66	70	8.00
D-610	5	6.53, 7.48, 8.43, 9.39, 10.35	70	8.00
D-510	6	5.59, 6.53, 7.48, 8.43, 9.39, 10.35	70	9.00
D-06	7	01.0, 1.9, 2.81, 3.73, 4.66, 5.59, 6.53	70	10.00
D-09	10	01.0, 1.9, 2.81, 3.73, 4.66, 5.59, 6.53, 7.48, 8.43, 9.39	70	13.00
D-010	11	01.0, 1.9, 2.81, 3.73, 4.66, 5.59, 6.53, 7.48, 8.43, 9.39, 10.35	70	14.00
International Standard				
D-47	7	2.45, 2.545, 3.60, 3.5.60, 4.75, 5.90, 61.00	71	10.00
D-48	8	2.45, 2.545, 3.60, 3.5.60, 4.75, 5.90, 61.00, 71.00	71	11.00
F-46	6	4.75, 5.90, 61.00, 81.25, 101.50, 121.75	71	12.25

OPENING DIE SCREW PLATES

55	4	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 2	58	\$6.00
57	2	$\frac{1}{8}$, $\frac{1}{4}$	58	65.00
58	4	$\frac{1}{8}$, $\frac{1}{4}$, 2	58	83.00
59	2	$\frac{1}{4}$, 2	58	63.00



Repair Parts for "Button" Die Screw Plates

Shown on pages 53 to 55

Cutting Size	Tap	Die		Cutting Size	Tap	Die		
		$\frac{13}{16}$ " Diam.	1" Diam.			$\frac{13}{16}$ " Diam.	1" Diam.	1½" Diam.
Mach. Scr.								
2	\$.45	\$.80		$\frac{7}{64}$	\$.40	\$.60		
3	.40	.70		$\frac{1}{8}$	.35	.60	\$.75	
4	.40	.60		$\frac{9}{64}$	.35	.60	.75	
5	.35	.60		$\frac{5}{32}$	.35	.60	.75	
6	.35	.60	\$.75	$\frac{3}{16}$	.40	.60	.75	
8	.35	.60	.75	$\frac{7}{32}$	.45	.60	.75	
10	.40	.60	.75	$\frac{1}{4}$	.45	.60	.75	\$1.25
12	.45	.60	.75	$\frac{5}{16}$	.50	.60	.75	1.25
14	.45	.60	.75	$\frac{3}{8}$	.55	.....	.75	1.25
16	.45	.60	.75	$\frac{13}{32}$	Spec.	.....	Spec.	.....
18	.50	.60	.75	$\frac{7}{16}$	.60	.....	.75	1.25
Fractional				$\frac{1}{2}$	.70	.....	Spec.	1.25
$\frac{1}{16}$	.50	.90		$\frac{9}{16}$	.80	.....	.....	1.25
$\frac{5}{64}$	.45	.80		$\frac{5}{8}$	.90	.....	.....	1.25
$\frac{3}{32}$	.40	.70						

Stocks

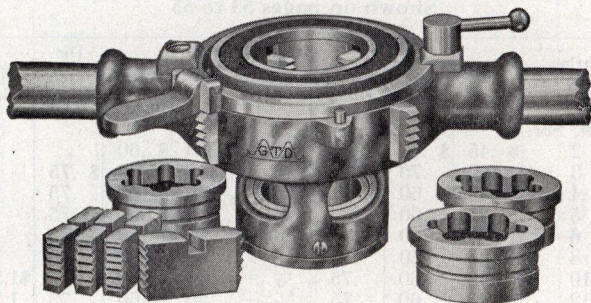
Number	Diam. of Die	Length	Price
1851	$\frac{13}{16}$ "	$6\frac{1}{4}$ "	\$1.00
1852	1"	9"	1.25
1853	$1\frac{1}{2}$ "	14"	2.00

Tap Wrenches

No.	Style	Capacity	Length	Price
329	T. Handle	$\frac{1}{16}$ " to $\frac{9}{32}$ "	$2\frac{1}{2}$ "	\$.50
333	T. Handle	$\frac{7}{32}$ " to $\frac{1}{2}$ "	$3\frac{5}{8}$ "	1.00
340	Stock Chuck	$\frac{1}{16}$ " to $\frac{9}{32}$ "	$2\frac{5}{8}$ "	.50
4	Regular	$\frac{1}{16}$ " to $\frac{3}{8}$ "	9"	3.00
5	Regular	$\frac{3}{16}$ " to $\frac{1}{2}$ "	11"	3.50
6	Regular	$\frac{1}{4}$ " to $\frac{3}{4}$ "	15"	4.00

Opening Die Screw Plates

Sizes $1\frac{3}{8}$ "-2"



USS right hand threads furnished unless otherwise specified.

- No. 55** 4 Sizes $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$, 2 **\$86.00**
Contains 1 Stock, 2 sets Dies, 4 Guides and 4 Taper Taps.
- No. 57** 2 Sizes $1\frac{5}{8}$, $1\frac{7}{8}$ **\$65.00**
Contains 1 Stock, 1 set Dies, 2 Guides and 2 Taper Taps.
- No. 58** 4 Sizes $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 **\$83.00**
Contains 1 Stock, 2 sets Dies, 4 Guides and 4 Taper Taps.
- No. 59** 2 Sizes $1\frac{3}{4}$, 2 **\$63.00**
Contains 1 Stock, 1 set Dies, 2 Guides, and 2 Taper Taps.

Prices of Parts

Taps						*Dies per set of 4		
$1\frac{3}{8}$ "	$1\frac{1}{2}$ "	$1\frac{5}{8}$ "	$1\frac{3}{4}$ "	$1\frac{7}{8}$ "	2"	$1\frac{3}{8}$, $1\frac{1}{2}$ "	$1\frac{5}{8}$, $1\frac{7}{8}$ "	$1\frac{3}{4}$, 2"
\$3.00	\$3.50	\$4.20	\$5.00	\$5.80	\$6.70	\$12.00	\$12.00	\$12.00

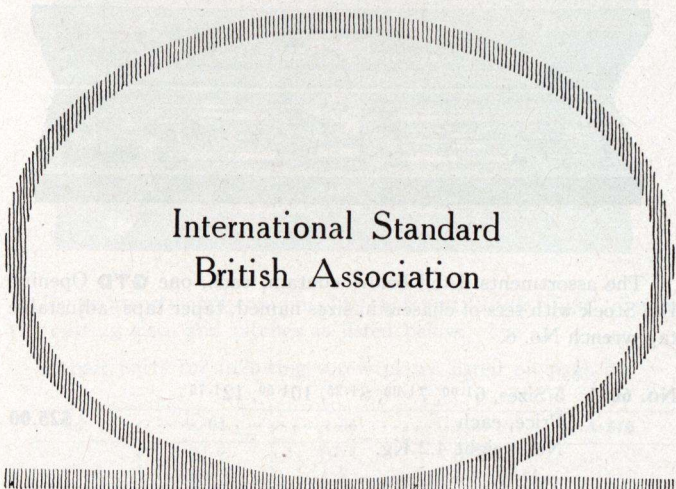
Stock only, \$40.00.

Guides, any size, \$1.00.

*Die lands are threaded on both ends. Each set of four lands will cut two sizes.

Adjustable Tap Wrench No. 22 (55" long) furnished for each of above assortments, if desired. For price, see page 113.

METRIC SCREW PLATE SECTION



International Standard
British Association

	Pages		Pages
GTD	60	"Green River"	68
"Little Giant"	61-64	"Lightning"	66, 67
"OK"	65	"Button" Die	70, 72

Metric GTD Opening Die Screw Plates

International Standard Thread



The assortments listed below contain, each, one GTD Opening Die Stock with sets of chasers in sizes named, taper taps, adjustable tap wrench No. 6.

No. 6041 5 Sizes, 6^{1.00}, 7^{1.00}, 8^{1.25}, 10^{1.50}, 12^{1.75}
 Price, each \$25.00
 Net weight 4.2 Kg.

No. 6045 7 Sizes, 6^{1.00}, 8^{1.25}, 10^{1.50}, 12^{1.75}, 14^{2.00}, 16^{2.00},
 18^{2.50}.
 Price, each \$35.00
 Net weight 5.1 Kg.

Repair Parts for Metric Opening Die Screw Plates

Shown above

Die Stock only, Cutting 6 mm. to 18 mm. \$10.00
 Chasers per set 2.00
 Taps and tap wrenches for above sets listed on
 page 64.



Little Giant Screw Plates

Single Stock

With British Association Threads



These assortments contain plug taps and "Little Giant" dies in the cutting sizes and pitches as listed below.

Repair parts for following screw plates listed on page 64.

No.	A-04	A-06	A-09	A-510
Cutting Sizes and Pitches mm.	01.0	01.0	01.0	
	1.9	1.9	1.9	
	2.81	2.81	2.81	
	3.73	3.73	3.73	
	4.66	4.66	4.66	
		5.59	5.59	5.59
		6.53	6.53	6.53
			7.48	7.48
			8.43	8.43
			9.39	9.39
				10.35
Diam. Collets	3.17 cm. or 1¼"			
Stock No. and Length	A1 19.05 cm. or 7½"			
Tap Wrench No.	0			
Net Weight lbs.	2½	3	4	2¾
Price Dollars	11.50	14.50	19.50	12.25



Metric *Little Giant* Screw Plates

International Standard Threads



These assortments contain taps (plug in A-41, A-42 and A-412 and taper in the balance) and "Little Giant" dies in the cutting size and pitches as listed below.

Repair parts for following screw plates listed on page 64.

No.	Single Stock					Two Stock
	A-41	A-42	41*	45	47	A-412†
Cutting Sizes and Pitches mm.	2.45	2.45				
		2.5-45				
	3.60	3.60				3.60
		3.5-60				
	4.75	4.75				4.75
	5.90	5.90				5.90
	61.00	61.00	61.00	61.00	61.00	61.00
			71.00			71.00
			81.25	81.25	81.25	81.25
			101.50	101.50	101.50	91.25
			121.75	121.75	121.75	101.50
				142.00	142.00	
				162.00	162.00	
				182.50	182.50	
					202.50	
					243.00	
Collets Diam. cm.	3.17	3.17	5.08	6.98	6.98	3.17, 4.13
Stock No. and Length	A-1 19.05 cm.	A-1 19.05 cm.	1 36.83 cm.	5 58.42 cm.	7 66.04 cm.	A-1 19.05 cm. A-10 34.29 cm.
Tap Wrench No.	0	0	5	6	5, 7	4
Net Weight Kg.	1.13	1.36	4.1	9.1	12.20	3
Price Dollars	11.50	14.50	18.50	27.50	42.00	20.25

*Contains bit brace shank.

†No. A-412 contains 3.17 cm. collets for sizes 6 mm. and smaller, and 4.13 cm. collets for sizes 7 mm. and larger.

Metric *Little Giant* Screw Plates



These assortments contain "Little Giant" dies and sets of taper, plug and bottoming taps or taper taps, as indicated, in the cutting sizes and pitches listed below.

Repair parts for following screw plates listed on page 64.

No.	Single Stock			Full Mounted Stock		
	Taper, Plug and Bottoming Hand Taps			Taper Taps		
	401	405	407	461	465	467
Cutting Sizes and Threads per mm.	61.00	61.00	61.00	61.00	61.00	61.00
	71.00			71.00		
	81.25	81.25	81.25	81.25	81.25	81.25
	101.50	101.50	101.50	101.50	101.50	101.50
	121.75	121.75	121.75	121.75	121.75	121.75
		142.00	142.00		142.00	142.00
		162.00	162.00		162.00	162.00
		182.50	182.50		182.50	182.50
Collets Diam. cm.			202.50			202.50
			243.00			243.00
Stock No. and Length	1 36.83 cm.	5 58.42 cm.	7 66.04 cm.	Separate stock for each die		
Tap Wrench No.	5	6	5, 7			
Net Wt. Kg.	4.42	10.43	15.44	5	6	5, 7
Price Dollars	22.00	35.75	50.50	6.13	10.9	15.44
				22.00	34.50	54.00



Repair Parts for Metric and British Association *Little Giant* Screw Plates

Shown on pages 61 to 63

Cut- ting Size	Price				Number of Collet or Stock	Price		
	Taps	Sets of Taps	A-1 Dies	Other Dies		Collet Com- plete	Stock	Full M't'd
B. A.								
No. 0	\$.35	\$1.05	\$.75					
1	.35	1.05	.75					
2	.35	1.05	.75					
3	.35	1.05	.75					
4	.35	1.05	.75					
5	.35	1.05	.75					
6	.35	1.05	.75					
7	.35	1.05	.75					
8	.35	1.05	.75					
9	.40	1.20	.75					
10	.45	1.35	.75					
Int'l								
2	.45	1.35	.75					
2.5	.40	1.20	.75					
3	.40	1.20	.75					
3.5	.35	1.05	.75					
4	.35	1.05	.75					
5	.35	1.05	.75					
6	.45	1.35	.75	\$1.00				\$2.90
7	.45	1.35	...	1.00		.80	2.00	2.90
8	.50	1.50	...	1.00		...	...	2.90
9	.55	1.65	...	1.25		...	...	3.45
10	.55	1.65	...	1.25		.80	2.50	3.45
12	.70	2.10	...	1.50		...	...	4.25
14	.80	2.40	...	1.50		...	...	4.25
16	.90	2.70	...	1.75		1.30	3.50	5.00
18	1.05	3.15	...	1.75		...	...	5.00
20	1.40	4.20	...	2.00		...	...	5.25
24	1.80	5.40	...	2.75		...	...	6.50

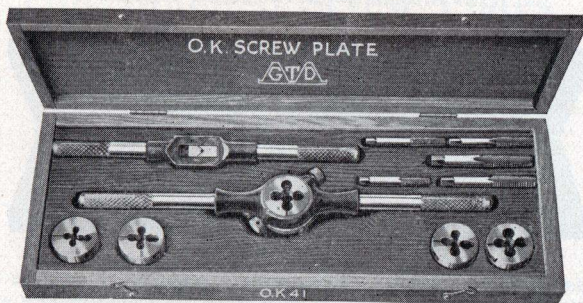
*Bit Brace Shank Guide for No. 1 (5.08 cm. diam.) Cap—50 cents.

Tap Wrenches

No.	Capacity		Length cm.	Price
	Brit. Ass'n	Intern'l Std.		
0	0 to 10	2 to 6	17.78	\$2.00
4	0 to 10	2 to 9	22.86	3.00
5	0 to 9	5 to 12	27.94	3.50
6		6 to 18	38.10	4.00
7		9 to 24	48.26	5.00

Metric "OK" Screw Plates

International Standard Threads



These assortments contain taper taps and "OK" dies in the cutting sizes and pitches as listed below.

No.	"OK" 41	"OK" 45	"OK" 47
Cutting Sizes and Pitches	61.00	61.00	61.00
	71.00		
	81.25	81.25	81.25
	101.50	101.50	101.50
	121.75	121.75	121.75
		142.00	142.00
		162.00	162.00
		182.50	182.50
			202.50
			243.00
Dies, Diam. cm.	3.81	5.08	5.08
Stock No. and Length	"OK" 1 35.56 cm.	"OK" 5 58.42 cm.	"OK" 10 66.04 cm.
Tap Wrench No.	5	5	4, 7
Net Weight kgs.	2.94	5.4	7
Price Dollars	15.50	23.50	35.50

Repair Parts for Metric "OK" Screw Plates

Cutting Sizes mm.	Taps	Diam. Dies		Adjustable Guide Stock	
		3.81 cm.	5.08 cm.	Number	Price
6	\$.45	\$1.25	\$2.00	} No. "OK" 1 } No. "OK" 5 } No. "OK" 10	\$3.00
7	.45	1.25	2.00		3.50
8	.50	1.25	2.00		
10	.55	1.25	2.00		
12	.70	1.25	2.00		
14	.80		2.00		
16	.90		2.00		
18	1.05		2.00		
20	1.40		2.00		
24	1.80		2.25		

Note:—See prices of Tap Wrenches at bottom of preceding page.



Metric ***LIGHTNING*** Screw Plates

With International Standard Threads



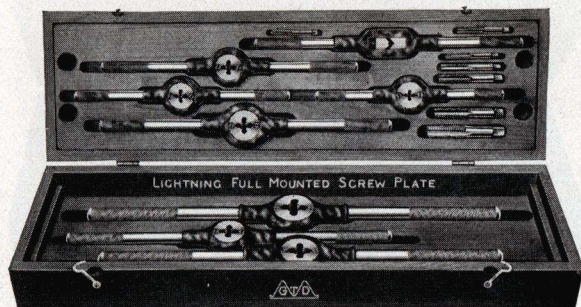
Assortments No. 8041, 8045 and 8047 contain taper taps and "Lightning" dies in the cutting sizes and pitches listed below.

Repair parts for following screw plates listed on page 69.

No.	Single Stock			Single Stock with Sets of Taper Plug and Bottoming Taps		
	8041	8045	8047	8401	8405	8407
Cutting Sizes and Pitches mm.	61.00	61.00	61.00	61.00	61.00	61.00
	71.00			71.00		
	81.25	81.25	81.25	81.25	81.25	81.25
	101.50	101.50	101.50	101.50	101.50	101.50
	121.75	121.75	121.75	121.75	121.75	121.75
		142.00	142.00		142.00	142.00
		162.00	162.00		162.00	162.00
		182.50	182.50		182.50	182.50
			202.50			202.50
			243.00			243.00
Collets Diam. cm.	5.56	6.98	6.98	5.56	6.98	6.98
Stock No. & length	1802 45.72 cm	1804 58.42 cm	1805 73.66 cm	1802 45.72 cm	1804 58.42 cm	1805 73.66 cm
Tap Wrench No.	5	6	5, 7	6	6	5, 7
Net Wt. kg.	5	9.5	12.7	8.5	10.89	16
Price Dollars	18.50	27.50	42.00	22.00	35.75	50.50

Metric ***LIGHTNING*** Full Mounted Screw Plates

With International Standard Threads



These full mounted assortments provide a separate stock for each cutting size.

Repair parts for following screw plates listed on page 69.

No.	Full Mounted		
	8461	8465	8467
Cutting Sizes and Pitches mm.	61.00	61.00	61.00
	71.00	71.00	
	81.25	81.25	81.25
	101.50	101.50	101.50
	121.75	121.75	121.75
		142.00	142.00
		162.00	162.00
		182.50	182.50
			202.50
			243.00
Tap Wrenches No.	5	6	5, 7
Net Weight kg.	7.25	10.43	20.86
Price Dollars	22.00	34.50	54.00

Metric GREEN RIVER Screw Plates

Single Stock

With International Standard Threads



The following screw plates contain taper taps and "Green River" dies in the cutting sizes and pitches listed below.

Repair parts for above screw plates listed on page 69.

No.	5041	5045	5047
Cutting Sizes and Threads mm.	61.00	61.00	61.00
	71.00		
	81.25	81.25	81.25
	101.50	101.50	101.50
	121.75	121.75	121.75
		142.00	142.00
		162.00	162.00
		182.50	182.50
			202.50
			243.00
Guide, Diam. cm.	5.56	5.56	6.98
Stock No. and Length	1802 45.72 cm.	1803 55.88 cm.	1805 73.66 cm.
Tap Wrench No.	5	6	5, 7
Net Weight kgs.	5	7.26	14.5
Price Dollars	18.50	27.50	42.00

Repair Parts for Metric ***LIGHTNING*** Screw Plates

Shown on pages 66 and 67

Cutting Size	Price			Collet		Elastic Stock		Full M'td Stock Only
	Tap	Sets of Taps	Die	No.	Price	No.	Price	
6	\$.45	\$1.35	\$1.00	} 1955	.....	.....	.....	\$2.00
7	.45	1.35	1.00		.....	.....	.....	2.00
8	.50	1.50	1.00		\$1.50	1802	\$3.00	2.00
10	.55	1.65	1.15		.....	.....	.....	2.25
12	.70	2.10	1.30	} 1956	1.50	1804	3.50	2.25
14	.80	2.40	1.60		.....	1805	3.50	2.75
16	.90	2.70	1.75		.....	.....	.....	3.25
18	1.05	3.15	2.00		.....	.....	.....	3.25
20	1.40	4.20	2.25	.....	.....	.....	.....	3.75
24	1.80	5.40	2.75	.....	.....	.....	.....	3.75

Repair Parts for Metric **GREEN RIVER** Screw Plates

Shown on page 68

Cutting Size	Price			Elastic Stock	
	Tap	Die	Guide	No.	Price
6	\$.45	\$1.25	\$1.00	} 1802	\$3.00
7	.45	1.25	1.00		
8	.50	1.25	1.00		
10	.55	1.50	1.00		
12	.70	1.50	1.00	} 1803	3.00
14	.80	1.60	1.00		
16	.90	1.75	1.00	} 1805	3.50
18	1.05	2.00	1.00		
20	1.40	2.25	1.00		
24	1.80	2.75	1.00		

Tap Wrenches

No.	Capacity	Length	Price
4	6 to 9 mm.	22.86 cm.	\$3.00
5	6 to 12 mm.	27.94 cm.	3.50
6	6 to 18 mm.	38.10 cm.	4.00
7	6 to 24 mm.	48.26 cm.	5.00



“Button” Die Screw Plates

Single Stock

British Association Threads



These assortments contain plug taps and adjustable round split dies in the cutting sizes and pitches listed below. Repair parts for following screw plates listed on page 72.

No.	D-04	D-610	D-510	D-06	D-09	D-010
Cutting Sizes and Pitches mm.	01.0			01.0	01.0	01.0
	1.9			1.9	1.9	1.9
	2.81			2.81	2.81	2.81
	3.73			3.73	3.73	3.73
	4.66			4.66	4.66	4.66
		6.53	5.59	5.59	5.59	5.59
		7.48	6.53	6.53	6.53	6.53
		8.43	7.48		7.48	7.48
		9.39	8.43		8.43	8.43
		10.35	9.39		9.39	9.39
			10.35			10.35
Dies Diam. cm.	2.06					
Stock No. and Length cm.	1851 15.88					
Tap Wrench No.	340 made to fit the die stock					
Net Weight lbs.	1¾	1¾	1¾	2	2¼	2½
Price Dollars	8.00	8.00	9.00	10.00	13.00	14.00

Metric “Button” Die Screw Plates Single Stock International Standard Thread



These assortments contain plug taps and round adjustable split dies in the cutting sizes and pitches as listed below.
Repair parts for following screw plates listed on page 72.

No.	D-47	D-48	F-46
Cutting Sizes and Pitches mm.	2.45 2.5.45 3.60 3.5.60 4.75 5.90 61.00	2.45 2.5.45 3.60 3.5.60 4.75 5.90 61.00 71.00	4.75 5.90 61.00 81.25 101.50 121.75
Dies Diam. cm.	2.06	2.06	2.54
Stocks Length cm.	15.88	15.88	22.86
Tap Wrench No.	340		4
Net Weight kg.	.79	.9	1.25
Price Dollars	10.00	11.00	12.25



Repair Parts for Metric and British Association "Button" Die Screw Plates

Shown on pages 70 and 71

Cutting Size	Price			Stock	
	Tap	Die		No.	Price
		2.06 cm.	2.54 cm.		
Brit. Ass'n Std.					
0	\$.35	\$.60		1851	\$1.00
1	.35	.60			
2	.35	.60			
3	.35	.60			
4	.35	.60			
5	.35	.60			
6	.35	.60			
7	.35	.60			
8	.35	.60			
9	.40	.60			
10	.45	.60			
Int'r'l Std.					
2 mm.	.45	.80		1852	1.25
2½ mm.	.40	.70			
3 mm.	.40	.60			
3½ mm.	.35	.60			
4 mm.	.35	.60	\$.75		
5 mm.	.35	.60	.75		
6 mm.	.45	.60	.75		
7 mm.	.45	.60	.75		
8 mm.	.50	....	.75
10 mm.	.55	....	.75
12 mm.	.70	....	.75

Tap Wrenches

No.	Capacity		Type	Price
	Brit. Ass'n	Intern'l Std.		
340	0 to 10	2 to 7	Tap Chuck	\$.50
4	0 to 10	2 to 9	Regular	3.00

Little Giant **Single Stock Screw Plates** With Twist Drills



USS threads furnished unless otherwise ordered.
 SAE or Whitworth Standard threads furnished at regular prices if specified.

No.	M-1		M-2		M-3	
	Tap	Drill	Tap	Drill	Tap	Drill
Cutting Sizes and Pitches	$\frac{1}{8}$ -40	38	$\frac{7}{64}$ -48	43	$\frac{7}{64}$ -48	43
			$\frac{1}{8}$ -40	38	$\frac{1}{8}$ -40	38
	$\frac{5}{32}$ -36	30	$\frac{9}{64}$ -40	32	$\frac{9}{64}$ -40	32
			$\frac{5}{32}$ -36	30	$\frac{5}{32}$ -36	30
	$\frac{3}{16}$ -24	26	$\frac{3}{16}$ -24	26	$\frac{11}{64}$ -32	$\frac{9}{64}$
					$\frac{3}{16}$ -24	26
	$\frac{7}{32}$ -24	16	$\frac{7}{32}$ -24	16	$\frac{13}{64}$ -24	20
	$\frac{1}{4}$ -20	7	$\frac{1}{4}$ -20	7	$\frac{7}{32}$ -24	16
					$\frac{15}{64}$ -24	10
					$\frac{1}{4}$ -20	7
Collets Diam. Inches	1 $\frac{1}{4}$		1 $\frac{1}{4}$		1 $\frac{1}{4}$	
Stocks, Length Inches	7 $\frac{1}{2}$		7 $\frac{1}{2}$		7 $\frac{1}{2}$	
Tap Wrench No.	0		0		0	
Net Weight lbs.	3		3 $\frac{1}{2}$		4 $\frac{1}{2}$	
Price Dollars	12.50		16.00		21.25	

Parts for above screw plates on page 20.

GTD

Tap and Drill Kits Save Time

All tapped holes should conform to these three rules:



1. A full depth of thread in a common nut is only 5% stronger than a 75% depth; yet it requires three times as much power to tap.
2. A common nut, drilled out to contain 50% depth of thread will break the bolt before it will strip—nine times out of ten.
3. A 75% depth of thread yields an ample margin of safety (2 to 1) and is ideal for tapping.

GTD Tap and Drill Kits Make it Easy to Follow These Rules

Right Drill For Each Size

Valuable time is saved by having a GTD Tap and Drill Kit handy. A drill which will produce the proper depth of thread with minimum possibility of tap breakage is furnished for each tap. No worry — no bother — right the first time.

Taps and Drills Always Together

Each kit is sold in an oiled and varnished hardwood box, which will stand machine shop usage.

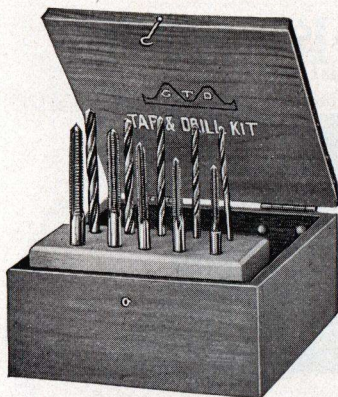
Every kit is neat and convenient in size and the smaller ones will slip easily into a pocket.

Easy to Select

The taps and drills are held in a wooden block which for convenience may be removed from the box and kept handy to the work; the drills and taps for each size are held side by side, so the right size may be instantly chosen.

Drill Chart With Each Kit

Each kit contains a tap drill chart which gives the proper size drill for every commonly used size and pitch of thread, from 0 Machine Screw, up to 4" 3 pitch hand tap size. The chart is printed on heavy glazed cardboard to resist grease and dirt and can be hung up in a place where it will be always ready for reference.



GTD

Tap and Drill Kits

Prices and Sizes

No.	Machine Screw						Fractional			
	801		802		803		USS		SAE	
	804		805							
	Tap	Drill	Tap	Drill	Tap	Drill	Tap	Drill	Tap	Drill
Cutting Sizes and Pitches	2-56	50			2-56	50	1/4-20	7	1/4-28	3
					3-48	47	5/16-18	F	5/16-24	I
	4-36	44	4-36	44	4-36	44	3/8-16	5/16	3/8-24	Q
	6-32	36	6-32	36	5-36	40	7/16-14	U	7/16-20	25/64
	8-32	29	8-32	29	6-32	36	1/2-13	27/64	1/2-20	29/64
	10-24	25	10-24	25	8-32	29				
			10-32	21	10-24	25				
			12-24	16	12-24	16				
			14-20	10	14-20	10				
Net Wt. lbs.	1 1/2		2 1/4		2 1/4		2 1/2		2 1/2	
Price Dollars	2.00		3.00		3.50		4.25		4.25	

The following assortments contain cutting sizes identical to those kits listed above, but are furnished with sets of taper, plug and bottoming taps for each cutting size.

No.	Machine Screw						Fractional			
	831		832		833		USS		SAE	
	834		835							
	Tap	Drill	Tap	Drill	Tap	Drill	Tap	Drill	Tap	Drill
Cutting Sizes and Pitches	2-56	50			2-56	50	1/4-20	7	1/4-20	3
					3-48	47	5/16-18	F	5/16-24	I
	4-36	44	4-36	44	4-36	44	3/8-16	5/16	3/8-24	Q
	6-32	36	6-32	36	5-36	40	7/16-14	U	7/16-20	25/64
	8-32	29	8-32	29	6-32	36	1/2-13	27/64	1/2-20	29/64
	10-24	25	10-24	25	8-32	29				
			10-32	21	10-24	25				
			12-24	16	12-24	16				
			14-20	10	14-20	10				
Net Wt. lbs.	2 1/4		2 3/4		3		3 1/4		3 1/4	
Price Dollars	4.00		6.00		7.00		8.25		8.25	



“Button” Die Screw Plates

With Twist Drills



These sets contain Adjustable Round Split Dies, $\frac{13}{16}$ " diameter; Plug Taps; Drill for each cutting size, No. 1851 stock ($6\frac{1}{4}$ " long); Tap Wrench made by inserting tap-chuck No. 140 in the die stock.

Machine Screw

No.	K5		K7		K10	
	Tap	Drill	Tap	Drill	Tap	Drill
Cutting Sizes	4-36	44	4-36	44	2-56	50
					3-48	47
	6-32	36	6-32	36	4-36	44
	8-32	29	8-32	29	5-36	40
	10-24	25	10-24	25	6-32	36
			10-32	21	8-32	29
	12-24	16	12-24	16	10-24	25
			14-20	10	10-32	21
					12-24	16
					14-20	10
Net Weight lbs.	2 $\frac{1}{4}$		2 $\frac{3}{4}$		3 $\frac{1}{2}$	
Price Dollars	9.00		11.50		15.00	

Fractional

No.	KK5		KK7		KK8	
	Tap	Drill	Tap	Drill	Tap	Drill
Cutting Sizes	$\frac{7}{64}$ -48	43	$\frac{7}{64}$ -48	43	$\frac{1}{16}$ -64	$\frac{3}{64}$
			$\frac{1}{8}$ -40	38	$\frac{5}{32}$ -50	49
	$\frac{5}{32}$ -36	30	$\frac{9}{64}$ -40	32	$\frac{7}{64}$ -48	43
	$\frac{3}{16}$ -24	26	$\frac{5}{32}$ -36	30	$\frac{1}{8}$ -40	38
	$\frac{7}{32}$ -24	16	$\frac{3}{16}$ -24	26	$\frac{5}{32}$ -36	30
	$\frac{1}{4}$ -20	7	$\frac{7}{32}$ -24	16	$\frac{3}{16}$ -24	26
			$\frac{1}{4}$ -20	7	$\frac{7}{32}$ -24	16
					$\frac{1}{4}$ -20	7
Net Weight lbs.	2		2 $\frac{3}{4}$		2 $\frac{3}{4}$	
Price Dollars	9.00		11.50		12.75	

USS threads furnished unless otherwise ordered.

SAE or Whitworth Standard threads furnished at regular prices if specified.

Repair parts for screw plates listed above shown on page 57.

TAP SECTION

Taps
Tap Wrenches
Hobs

	Pages		Pages
Beaman & Smith	89	Nut	88
Boiler	97	Patch Bolt	98
British Association	93	Pipe	100, 101
Coupling	105	Pipe Tap Set (Auto)	100
"Gun"	78-80	Pulley	92
Hand	83-85	Serial	86, 87
Hob Short Die	102	Spark Plug Tap Set	85
Hob Long Die	103	Special	114, 115
Hob Pipe	104	Staybolt	94-96
Machine Screw	82	Stovebolt	93
"Maxi"	94, 95	Tapper	90-92
Metric	106-111	Tapper Bent Shank	91
Mud Plug	99	Wrenches	112, 113

The "Gun" Tap

(Patented December 28, 1915)



Three Fluted "Gun" Tap

The "Gun" Tap is radically different in design from the ordinary hand tap and offers the advantages of better quality work with increased speed and longer life.

Before placing this tool on the market it was thoroughly tried out by our Experimental Department and then in actual shop practice in our own factories. At present "Gun" Taps are used and enthusiastically endorsed by the most progressive plants all over the country.

The reason that tapping operations have been so costly heretofore, lies in the fact that fully 90% of all taps used are scrapped for breakage. They don't have a chance to wear out.

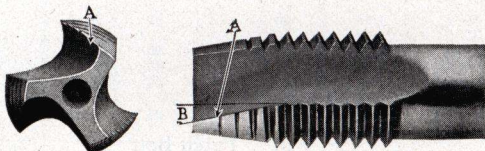


Fig. 1

This extravagant wastage of expensive tools has been tolerated for years — for while everyone realized the failings of the conventional taps, they were the best the market afforded.

Less Expensive

With the advent of the "Gun" Tap the whole situation has been relieved. The "Gun" Tap is at least twice as strong and requires not more than half as much power to drive as the ordinary tap. Therefore, a "Gun" Tap very seldom breaks in the work. Furthermore, in many cases one "Gun" Tap serves where formerly two and sometimes three taps were required for the operation.



Two Fluted "Gun" Tap

Patented Design

The secret of the "*Gun*" Tap's success lies in its radically different design, Fig. 1. The cutting edges (A) at the point of the tap are ground at an angle (B) to the axis for a distance of three or four threads. This angle, in conjunction with the hook of the land and the special flute form, produces a long curling chip similar to that of a well-ground lathe tool. This chip is not passed out through the flutes as in the ordinary tap but shoots out ahead of the tool as it progresses—hence the name "*Gun*" Tap.



Exceptional Strength

Owing to the fact that the flutes are not required for the passage of chips they are made comparatively shallow, leaving a very large cross-sectional area. In fact, there is as much metal in the threaded section as in the shank. This accounts for the exceptional strength of the "*Gun*" Tap.

All of the cutting is done by the first few teeth. The rest of the thread, acting as a lead screw, steadies the tap and produces very accurate work.

It Shears

The angular cutting edge with its pronounced hook shears the metal instead of tearing it off with a full face-on scrape. This shearing action completes the work with less than half the power required to drive the ordinary tap. Furthermore, it cuts a much cleaner thread in any material whether it be lead or chrome vanadium steel. Tests run in ten different metals varying from soft to hard have established the fact that the "*Gun*" Tap will hold its size and lead in any material.



Long Lived

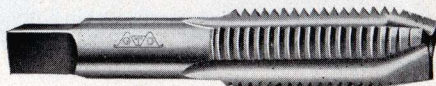
As the grinding is done only on the angular cutting edges, the tap will cut to size until it has been ground down to the last three or four teeth.



"Gun" Taps

No. 301

Sizes and Pitches Regularly Furnished



Machine Screw Sizes

Screw Gage No.	Price Each	Number of Threads to the Inch		No. of Flutes	Screw Gage No.	Price Each	Number of Threads to the Inch		No. of Flutes
		Std.	Also Furnished				Std.	Also Furnished	
3	\$.60	56	48	2	10	\$.50	30	24, 28, 32	2
4	.50	48	32, 36, 40	2	12	.55	28	24, 32	2
5	.45	44	36, 40	2	14	.55	24	20	2
6	.45	40	32, 36	2	16	.55	22	18, 20	2
7	.45	36	30, 32	2	18	.60	20	18	2
8	.45	36	30, 32, 40	2	20	.60	20	16, 18	2
9	.45	32	24, 30	2					

Fractional Sizes*

Dia. Tap In.	Price Each	Number of Threads		No. of Flutes	Dia. Tap In.	Price Each	Number of Threads		No. of Flutes
		USF	SAE Std.				USF	SAE Std.	
$\frac{1}{8}$	\$.45	40		2	$\frac{3}{4}$	\$1.30	10	16	3
$\frac{3}{16}$	.50	24, 32		2	$\frac{13}{16}$	1.55	10		3
$\frac{1}{4}$	.55	20, 24, 32	28	2	$\frac{7}{8}$	1.75	9	14, 18	4
$\frac{5}{16}$	.60	18, 20, 32	24	2	$\frac{15}{16}$	2.00	9		4
$\frac{3}{8}$	.65	16	24	2	1	2.20	8	14	4
$\frac{7}{16}$	.65	14	20	3	$1\frac{1}{8}$	2.40	7	12	4
$\frac{1}{2}$	.75	13	20	3	$1\frac{1}{4}$	2.75	7	12	5
$\frac{9}{16}$	.90	12	18	3	$1\frac{3}{8}$	3.20	6	12	5
$\frac{5}{8}$	1.00	11	18	3	$1\frac{1}{2}$	3.70	6	12	5
$\frac{11}{16}$	1.15	11	16	3					

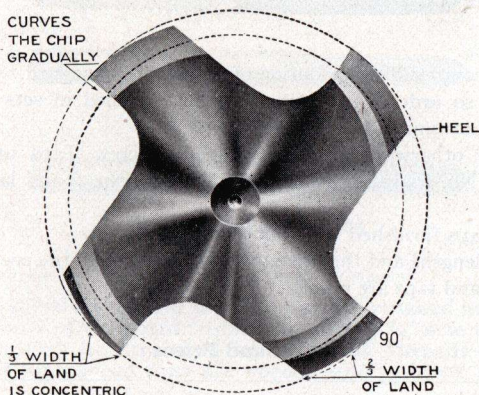
Stovebolt "Gun" Taps $\frac{3}{16}$ " \$.50, $\frac{1}{4}$ " \$.55, $\frac{5}{16}$ " \$.60, $\frac{3}{8}$ " \$.65.

Whitworth Standard threads furnished at regular prices if specified.

*Also furnished in British Standard Fine Thread $\frac{1}{4}$ " to 1", see Hand Tap list on page 85 for pitches.

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

Machine Relieved Taps



The **machine-relief**, in the design of **GTD** Taps, is readily understood by reference to the above cut.

One-third of the tooth, back of the cutting edge, retains the full cutting size. The remaining two-thirds is relieved on top, bottom and sides.

This feature is of significance because it not only reduces friction and binding to a minimum, but also helps to insure clean, smooth, accurate threads.

Applying this form of relief preserves the full size of the tap clear up to the shank, ample stock being left behind the cutting edge so that it may be reground for sharpening many times without destroying the size.



Machine Screw Taps

No. 305



We recommend the adoption of the ASME standard.

When so ordered, the taps will be furnished in sets of taper, plug and bottoming, like hand taps.

Unless otherwise specified, Machine Screw Taps up to and including No. 5 are furnished with 3 flutes; No. 6 and larger with 4 flutes.

Plug taps furnished unless otherwise specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Screw Gage No.	Basic Outside Diameter Inches	Price		Number of Threads to the Inch	
		Each	Each High Speed Steel	Standard	Also Furnished
0	.060	\$.50	**	80	.....
1	.073	.50	**	72	56, 64
2	.086	.45	**	64	56
3	.099	.40	**	56	48
4	.112	.40	\$.50	48	32, 36, 40
5	.125	.35	.50	44	36, 40
6	.138	.35	.50	40	32, 36
7	.151	.35	.50	36	30, 32
8	.164	.35	.50	36	30, 32, 40
9	.177	.35	.60	32	24, 30
10	.190	.40	.60	30	24, 28, 32
12	.216	.45	.70	28	24, 32
14	.242	.45	.80	24	20
16	.268	.45	**	22	18, 20
18	.294	.50	**	20	18
20	.320	.50	**	20	16, 18

**Prices on application.

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

Hand Taps

Smaller than $\frac{1}{4}$ "



Taper — No. 302



Plug — No. 303



Bottoming — No. 304

USS threads furnished unless otherwise ordered.

High speed steel hand taps regularly furnished in standard pitches only of US Form thread, excepting $\frac{3}{16}$ " size which will also regularly be furnished with 32 USF threads per inch. All other high speed taps are special and subject to special prices.

Sizes and threads not listed are subject to special prices.
Left hand taps are special.

Diam. of Tap Inches	Price			No. of Threads to the Inch		
				Standard Pitches		USF Threads also Fur- nished
	Each	Per Set	Each High Speed Steel	USS	Whit- worth	
$\frac{1}{16}$	\$.50	\$1.50	**	64	60	72
$\frac{5}{64}$	.45	1.35	**	60	....	72
$\frac{3}{32}$	.40	1.20	**	50	48	48
$\frac{7}{64}$	.40	1.20	**	48	....	....
$\frac{1}{8}$	.35	1.05	\$.50	40	40	32
$\frac{9}{64}$	.35	1.05	**	40	....	....
$\frac{5}{32}$	.35	1.05	.50	36	32	32
$\frac{11}{64}$	.35	1.05	**	32	....	....
$\frac{3}{16}$	.40	1.20	.60	24	24	32
$\frac{13}{64}$	.40	1.20	**	24	24	....
$\frac{7}{32}$	.45	1.35	.70	24	24	32
$\frac{15}{64}$	.45	1.35	**	24	24	....

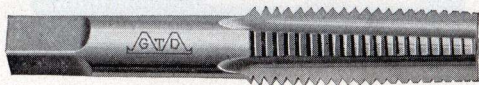
** Prices on application.

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

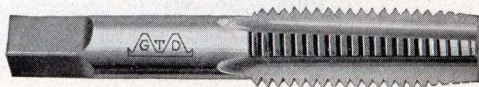


Hand Taps

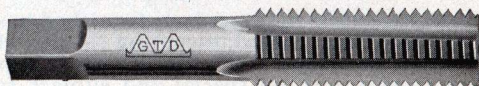
$\frac{1}{4}$ Inch and Larger



Taper — No. 302



Plug — No. 303



Bottoming — No. 304

Orders for hand taps to and including $\frac{5}{16}$ inch will be filled with taps having shanks full diameter of thread. Taps $\frac{3}{8}$ inch and larger will be furnished with shanks size of bottom of thread.

We will furnish at regular prices $\frac{3}{8}$ inch hand taps with shanks full diameter of thread.

High speed steel hand taps are regularly furnished in USS and SAE standard pitches only. All other high speed steel hand taps are special and subject to special prices.

USS threads furnished unless otherwise ordered.

SAE and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.



Hand Tap with Full Size Shank



Hand Taps

$\frac{1}{4}$ Inch and Larger

Sizes and Prices

Diam. of Tap Inches	Price			Number of Threads to the Inch				
	Each	Per Set	Each High Speed Steel	Standard Pitches				USF Threads also Furnished
				USS	SAE Std.	Whit. Std.	BSF	
$\frac{1}{4}$	\$.45	\$1.35	\$.80	20	28	20	26	24, 27, 32
$\frac{5}{16}$	.50	1.50	1.00	18	24	18	22	20, 27 32
$\frac{3}{8}$	.55	1.65	1.25	16	24	16	20	20, 27
$\frac{7}{16}$	.60	1.80	1.55	14	20	14	18	24, 27
$\frac{1}{2}$	.70	2.10	1.90	13	20	12	16	12, 24, 27
$\frac{9}{16}$	.80	2.40	2.30	12	18	12	16	27
$\frac{5}{8}$	.90	2.70	2.75	11	18	11	14	12, 27
$\frac{11}{16}$	1.05	3.15	3.25	11	16	11	14	.....
$\frac{3}{4}$	1.20	3.60	3.75	10	16	10	12	12, 27
$\frac{13}{16}$	1.40	4.20	4.30	10	....	10	12	.....
$\frac{7}{8}$	1.60	4.80	5.00	9	14, 18*	9	11	12, 27
$\frac{15}{16}$	1.80	5.40	5.80	9	....	9	....	.....
1	2.00	6.00	6.75	8	14	8	10	12, 27
$1\frac{1}{8}$	2.25	6.75	8.75	7	12	7	9	.....
$1\frac{1}{4}$	2.60	7.80	11.00	7	12	7	9	.....
$1\frac{3}{8}$	3.00	9.00	13.50	6	12	6	8	.....
$1\frac{1}{2}$	3.50	10.50	16.00	6	12	6	8	.....
$1\frac{5}{8}$	4.20	12.60	**	5½	....	5	....	.....
$1\frac{3}{4}$	5.00	15.00	**	5	....	5	....	.....
$1\frac{7}{8}$	5.80	17.40	**	5	....	4½	....	.....
2	6.70	20.10	**	4½	....	4½	....	.....
$2\frac{1}{8}$	8.00	24.00	**	4½	....	4½	....	.....
$2\frac{1}{4}$	9.20	27.60	**	4½	....	4	....	.....
$2\frac{3}{8}$	10.50	31.50	**	4	....	4	....	.....
$2\frac{1}{2}$	11.50	34.50	**	4	....	4	....	.....

* Standard Spark Plug Size.

** Prices on application.

Pump Rod Taps

Pump Rod Hand No. 350 or Bit Brace Shank No. 351 Taper Taps $\frac{3}{8}$ ¹⁴, $\frac{7}{16}$ ¹², $\frac{1}{2}$ ¹² V thread $\frac{1}{32}$ oversize, can be furnished at regular hand tap prices.

Spark Plug Tap Set No. 33 (in handy wooden box)

containing $\frac{7}{8}$ -18 SAE

18mm.-1.5 mm. Pitch

$\frac{1}{2}$ Briggs Standard Pipe

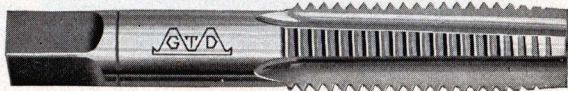
List price - - \$3.80

All tools catalogd are made to standard commercial tolerances.

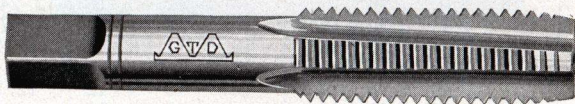
For specials, see page 115.

Serial Taps

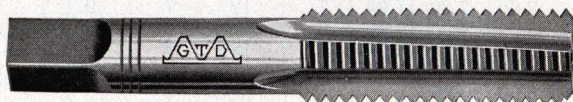
No. 309



No. 1



No. 2



No. 3

Serial Taps have a distinct advantage over taper, plug and bottoming taps for certain classes of work, such as tapping hard, tough metal or blind holes.

Unlike the taper, plug and bottoming hand taps each of which cuts the full size and form of thread—Serial Taps are so made that the work and strain is divided proportionately among the three taps.

Thus No. 1 tap, the smallest of the three, both in outside and pitch diameter, makes the roughing cut. This is followed by No. 2 which cuts the thread a little fuller. Finally, No. 3 tap smooths up the thread and brings it to exact size.

With the division of working strain among the three taps, a greatly lessened percentage of breakage results.

Serial Taps

Serial Taps are furnished with shanks full size of thread up to $\frac{3}{8}$ inch inclusive, and with shanks size of bottom of thread $\frac{7}{16}$ inch and larger.

USS and Whitworth Standard threads only are carried in stock and furnished at regular prices.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Diameter of Tap Inches	Price		Number Threads to the Inch	
	Each	Per Set	USS	Whit. Std.
$\frac{3}{16}$	\$.40	\$1.20	24	24
$\frac{1}{4}$	.45	1.35	20	20
$\frac{5}{16}$	.50	1.50	18	18
$\frac{3}{8}$	.55	1.65	16	16
$\frac{7}{16}$	.60	1.80	14	14
$\frac{1}{2}$	.70	2.10	13	12
$\frac{9}{16}$	.80	2.40	12	12
$\frac{5}{8}$	.90	2.70	11	11
$\frac{11}{16}$	1.05	3.15	11	11
$\frac{3}{4}$	1.20	3.60	10	10
$\frac{13}{16}$	1.40	4.20	10	10
$\frac{7}{8}$	1.60	4.80	9	9
$\frac{15}{16}$	1.80	5.40	9	9
1	2.00	6.00	8	8
$1\frac{1}{8}$	2.25	6.75	7	7
$1\frac{1}{4}$	2.60	7.80	7	7
$1\frac{3}{8}$	3.00	9.00	6	6
$1\frac{1}{2}$	3.50	10.50	6	6

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.



Nut Taps

No. 306

USS threads furnished unless otherwise ordered.


High Speed Steel Nut Taps will be regularly furnished in USS and SAE Standard only. All other high speed steel nut taps are special and subject to special prices.

SAE and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices



Dia. Tap In.	Price Each		Number of Threads to the Inch				Length of Thread, In.		Len. Over- all In.
	Car- bon Steel	High Speed Steel	USS	SAE Std.	Whit. Std.	BSF	USS, Whit.	SAE, BSF	
$\frac{3}{16}$	\$.60	\$1.20	24,32	..	24	..	$1\frac{3}{8}$	1	4 $\frac{1}{2}$
$\frac{1}{4}$	.60	1.40	20	28	20	26	$1\frac{5}{8}$	1 $\frac{1}{4}$	5
$\frac{5}{16}$	.70	1.60	18	24	18	22	$1\frac{3}{4}$	1 $\frac{3}{8}$	5 $\frac{1}{2}$
$\frac{3}{8}$	.80	1.90	16	24	16	20	2	1 $\frac{1}{2}$	6
$\frac{7}{16}$	.90	2.25	14	20	14	18	$2\frac{3}{8}$	1 $\frac{3}{4}$	6 $\frac{1}{2}$
$\frac{1}{2}$	1.00	2.70	13	20	12	16	$2\frac{1}{2}$	1 $\frac{7}{8}$	7
$\frac{9}{16}$	1.15	3.25	12	18	12	16	$2\frac{3}{4}$	2	7 $\frac{1}{2}$
$\frac{5}{8}$	1.35	3.85	11	18	11	14	3	2 $\frac{1}{4}$	8
$\frac{11}{16}$	1.60	4.50	11	16	11	14	3	2 $\frac{1}{4}$	8 $\frac{1}{2}$
$\frac{3}{4}$	1.85	5.20	10	16	10	12	$3\frac{1}{4}$	2 $\frac{1}{2}$	9
$\frac{13}{16}$	2.15	6.00	10	..	10	12	$3\frac{1}{4}$	..	9 $\frac{1}{2}$
$\frac{7}{8}$	2.45	7.00	9	14, 18	9	11	$3\frac{5}{8}$	2 $\frac{3}{4}$	10
$\frac{15}{16}$	2.80	8.25	9	..	9	..	$3\frac{5}{8}$	..	10 $\frac{1}{2}$
1	3.15	9.75	8	14	8	10	4	3	11
$1\frac{1}{8}$	3.70	12.50	7	12	7	9	$4\frac{3}{4}$	3 $\frac{1}{2}$	11 $\frac{1}{2}$
$1\frac{1}{4}$	4.50	16.00	7	12	7	9	$4\frac{3}{4}$	3 $\frac{1}{2}$	12
$1\frac{3}{8}$	5.50	20.00	6	12	6	8	$5\frac{3}{8}$	4	12 $\frac{1}{2}$
$1\frac{1}{2}$	6.75	25.00	6	12	6	8	$5\frac{3}{8}$	4	13
$1\frac{5}{8}$	8.00	**	5 $\frac{1}{2}$	..	5	..	$5\frac{1}{2}$	..	13 $\frac{1}{2}$
$1\frac{3}{4}$	9.25	**	5	..	5	..	$5\frac{1}{2}$	..	14
$1\frac{7}{8}$	10.75	**	5	..	4 $\frac{1}{2}$	..	$5\frac{1}{2}$	..	14 $\frac{1}{2}$
2	12.25	**	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	..	$6\frac{1}{8}$	..	15
$2\frac{1}{8}$	14.00	**	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	..	$6\frac{1}{8}$	..	15 $\frac{1}{2}$
$2\frac{1}{4}$	15.75	**	4 $\frac{1}{2}$	..	4	..	$6\frac{1}{8}$	..	16
$2\frac{3}{8}$	17.75	**	4	..	4	..	$6\frac{7}{8}$	..	16 $\frac{1}{2}$
$2\frac{1}{2}$	20.00	**	4	..	4	..	$6\frac{7}{8}$	..	17

** Prices on application.

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

Taps for Beaman & Smith Holder

No. 328



These taps are used in the Beaman & Smith Patent Safety Drill and Tap Holders. When ordering for these holders, specify number. These taps are also used in Wizard Turret Tap Holders and when ordering for these holders, specify collet number. (No. 51 for $\frac{3}{8}$ " shank, No. 52 for $\frac{1}{2}$ " shank, No. 53 for $\frac{3}{4}$ " shank.)

Taps for Beaman & Smith Holders are regularly furnished in plug style only.

USS threads furnished unless otherwise ordered.

SAE Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Diam. of Tap Inches	Price Each				No. Threads to the Inch		Dia. of Shank Inches	Length Overall Inches
	Carbon Steel		High Speed Steel					
	Fitting No. 1 Holder	Fitting No. 2 Holder	Fitting No. 1 Holder	Fitting No. 2 Holder	USS	SAE Std.		
$\frac{1}{4}$	\$.55	....	\$1.50	....	20	28	$\frac{3}{8}$	$2\frac{3}{4}$
$\frac{5}{16}$	.55	....	1.50	....	18	24	$\frac{3}{8}$	3
$\frac{3}{8}$	.55	....	1.60	....	16	24	$\frac{3}{8}$	$3\frac{1}{4}$
$\frac{7}{16}$	.75	....	2.30	....	14	20	$\frac{1}{2}$	$3\frac{1}{2}$
$\frac{1}{2}$	.75	....	2.40	....	13	20	$\frac{1}{2}$	$3\frac{3}{4}$
$\frac{9}{16}$	.80	....	2.75	....	12	18	$\frac{1}{2}$	4
$\frac{5}{8}$	.90	....	3.30	....	11	18	$\frac{1}{2}$	4
$\frac{3}{4}$	..	\$1.20	....	\$4.20	11	18	$\frac{3}{4}$	$3\frac{13}{16}$
$\frac{7}{8}$	..	1.20	....	4.50	11	16	$\frac{3}{4}$	$4\frac{1}{8}$
$\frac{1}{8}$	..	1.20	....	4.50	10	16	$\frac{3}{4}$	$4\frac{7}{16}$
$\frac{11}{16}$	..	1.50	....	5.15	10	..	$\frac{3}{4}$	$4\frac{3}{4}$
$\frac{7}{8}$	..	1.60	....	6.50	9	14, 18	$\frac{3}{4}$	$5\frac{1}{16}$
$\frac{1}{8}$	..	1.80	....	7.50	9	..	$\frac{3}{4}$	$5\frac{3}{8}$
1	..	2.20	....	8.10	8	14	$\frac{3}{4}$	$5\frac{9}{16}$
$1\frac{1}{8}$	..	2.40	....	10.50	7	12	$\frac{3}{4}$	6
$1\frac{1}{4}$	..	2.60	....	3.20	7	12	$\frac{3}{4}$	6

Prices on taps fitting No. 2 $\frac{1}{2}$ and No. 3 holders given on application.

All tools catalogd are made to standard commercial tolerances.

For specials, see page 115.



Tapper Taps

No. 307



Tapper Taps will be furnished with plain round, squared, flatted, Acme or all styles of National Shanks at regular prices.

Specify size, length, form of thread and style of shank.

USS threads furnished unless otherwise ordered.

SAE and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Dia. Tap In.	Length Overall—Price Ea.				Number of Threads to the Inch			Length of Thread Inches	
	11"	12"	14"	15"	USS	SAE Std.	Whit Std.	USS, Whit Std.	SAE
1/4	\$.70	\$.75	\$.80	...	20	28	20	1 5/8	1 1/4
5/16	.80	.85	.90	...	18	24	18	1 1/8	1 3/8
3/8	.90	.95	1.00	\$1.10	16	24	16	2	1 1/2
1/2	1.00	1.05	1.15	1.25	14	20	14	2 1/4	1 5/8
5/8	1.10	1.15	1.25	1.35	13	20	12	2 1/4	1 5/8
3/4	1.30	1.35	1.45	1.55	12	18	12	2 1/2	1 7/8
7/8	1.45	1.50	1.65	1.75	11	18	11	2 1/2	1 7/8
1		1.70	1.80	1.95	11	16	11	2 1/2	1 7/8
1 1/8		1.95	2.00	2.10	10	16	10	2 3/4	2
1 1/4		2.20	2.25	2.35	10	...	10	2 3/4	...
1 1/2		2.50	2.60	2.75	9	14, 18	9	3	2
1 3/4		2.90	3.00	3.15	9	...	9	3	...
2		3.30	3.50	3.65	8	14	8	3 1/2	2 5/8
2 1/8			4.00	4.15	7	12	7	3 1/2	2 5/8
2 1/4			4.90	5.10	7	12	7	3 1/2	2 5/8
2 1/2			5.75	6.00	6	12	6	4	3
2 3/4			7.05	7.35	6	12	6	4	3
3			8.00	8.35	5 1/2	...	5	4	...
3 1/8			9.25	9.65	5	...	5	4 1/2	...
3 1/4			10.15	10.75	5	...	4 1/2	4 1/2	...
3 1/2			11.50	12.25	4 1/2	...	4 1/2	4 1/2	...

Principal styles of Tapper Tap Shanks illustrated on opposite page.

All tools catalogd are made to standard commercial tolerances.

For specials, see page 115.

Bent Shank Tapper Taps

No. 352

For National Tapper

These taps are designed for use in the Automatic Tapping Machines manufactured by the National Machinery Co.

Sizes, lengths and threads not listed are special and subject to special prices.

Left hand taps are special.

Sizes and Prices

Diam. of Tap Inches	Price Each	No. of Threads to the Inch		Size of Ma- chine	Length of Thread Inches		Length Overall Before Bending Inches
		USS	SAE Std.		USS	SAE Std.	
$\frac{1}{8}$	\$.65	40	..	$\frac{1}{4}$ "	$1\frac{3}{16}$	...	$6\frac{3}{8}$
$\frac{3}{16}$	.65	24	..	$\frac{1}{4}$ "	1	...	$6\frac{3}{8}$
$\frac{1}{4}$	.65	20	28	$\frac{1}{4}$ "	$1\frac{7}{32}$	$1\frac{1}{8}$	$6\frac{3}{8}$
$\frac{1}{4}$	.70	20	28	$\frac{3}{8}$ "	$1\frac{7}{32}$	$1\frac{1}{8}$	$8\frac{3}{4}$
$\frac{5}{16}$	.80	18	24	$\frac{3}{8}$ "	$1\frac{3}{8}$	$1\frac{3}{8}$	$8\frac{3}{4}$
$\frac{3}{8}$	.90	16	24	$\frac{3}{8}$ "	$1\frac{17}{32}$	$1\frac{3}{8}$	$8\frac{3}{4}$
$\frac{3}{8}$	.95	16	24	$\frac{1}{2}$ "	$1\frac{17}{32}$	$1\frac{3}{8}$	$11\frac{7}{8}$
$\frac{7}{16}$	1.05	14	20	$\frac{1}{2}$ "	$1\frac{23}{32}$	$1\frac{5}{8}$	$11\frac{7}{8}$
$\frac{1}{2}$	1.15	13	20	$\frac{1}{2}$ "	$1\frac{7}{8}$	$1\frac{5}{8}$	$11\frac{7}{8}$

Principal styles of Tapper Tap Shanks
(see opposite page)



Plain Round



Plain Square



Acme

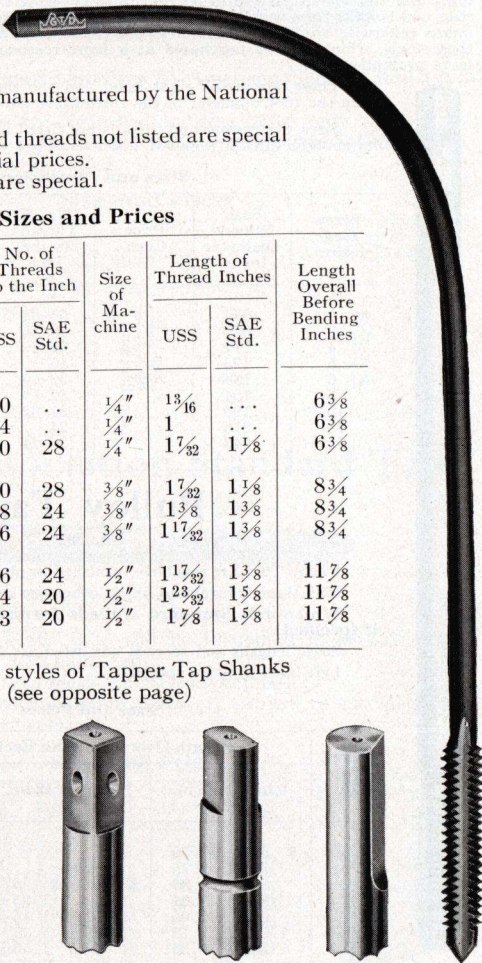


National



Flatted

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.





Tapper Taps

ASME Standard Sizes

Owing to the increased demand for Tapper Taps for tapping ASME Standard nuts, and the wide variation in specifications covering these tools, the following sizes and lengths have been adopted as a tentative standard and will be furnished unless otherwise specified. Customers are recommended to avail themselves of these tools, which can be purchased at a more reasonable price and delivered more promptly.

These taps are all right hand and the shanks, which are smaller than the root diameter of the thread, are not squared.

Sizes, dimensions and threads not listed in the following table will be manufactured if required, upon receipt of customer's specifications.

Sizes and Dimensions

Screw Gage No.	Basic Outside Diameter Inches	Price Each	No. of Threads to the Inch	Length of Thread Inches	Length Overall Inches
2	.086	Prices on Application	56-64	$\frac{1}{2}$	5
3	.099		48-56	$\frac{5}{8}$	5
4	.112		36-40	$\frac{3}{4}$	6
5	.125		40	$\frac{3}{4}$	8
6	.138		32-40	$\frac{7}{8}$	8
8	.164		32	1	9
10	.190		24-32	$1\frac{1}{8}$	11
12	.216		24	$1\frac{1}{4}$	11
14	.242		20-24	$1\frac{3}{8}$	11

Pulley Taps

No. 308

Pulley Taps are regularly furnished in plug style only.

USS threads furnished unless otherwise ordered.

Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Diam. Tap In.	Length Overall — Price Each					No. Threads to the In. USS
	6 in.	8 in.	10 in.	12 in.	14 in.	
$\frac{1}{4}$	\$.65	\$.70	.....	.....	.....	20
$\frac{5}{16}$	.70	.75	.....	.....	.....	18
$\frac{3}{8}$	.80	.85	\$.90	\$.95	\$1.00	16
$\frac{7}{16}$	.85	.95	1.00	1.05	1.15	14
$\frac{1}{2}$	.95	1.05	1.10	1.15	1.25	13
$\frac{9}{16}$	1.00	1.15	1.25	1.35	1.45	12
$\frac{5}{8}$	1.10	1.35	1.40	1.50	1.65	11
$\frac{3}{4}$	.....	.....	1.85	1.95	2.00	10



Pulley Tap

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

Stove Bolt Taps

No. 314



These taps correspond in sizes to American Screw Company's Stove Bolts.

Stove Bolt Taps are furnished in plug style only.

Sizes, lengths and threads not listed are subject to special prices. Left hand taps are special.

Sizes and Prices

Diameter of Tap, Inches	Price Each	Number of Threads to the Inch
$\frac{3}{16}$	\$.40	24
$\frac{1}{4}$	.45	18
$\frac{5}{16}$	.50	18
$\frac{3}{8}$	.55	16

British Association Standard Taps



No. 354

When so ordered, the taps will be furnished in sets of taper, plug and bottoming, like hand taps.

Plug taps furnished unless otherwise specified.

Sizes, lengths and threads not listed are subject to special prices. Left hand taps are special.

Sizes and Prices

No.	Price Each	Diam. mm.	Pitch mm.	No.	Price Each	Diam. mm.	Pitch mm.
0	\$0.35	6.0	1.00	7	\$0.35	2.5	.48
1	.35	5.3	.90	8	.35	2.2	.43
2	.35	4.7	.81	9	.40	1.9	.39
3	.35	4.1	.73	10	.45	1.7	.35
4	.35	3.6	.66	12	.50	1.3	.28
5	.35	3.2	.59	14	.60	1.0	.23
6	.35	2.8	.53				



The “*Maxi*” Staybolt Tap

Patented July 31, 1917

No. 316

The “*Maxi*” Tap is a real departure in staybolt taps—for reasons stated below.

It is a maximum tap in speed and durability.

It has been marketed long enough to be thoroughly tested and proven, and its performance has been a surprise to the most expert boilermakers of the country.

The “*Maxi*” Tap consistently produces more holes per tap under actual working conditions than any staybolt tap yet designed. It has been perfected after years of experimentation during which period innumerable designs were tested and discarded.

Five features of the new “*Maxi*” Tap are responsible for its remarkable performance under the most trying conditions in both old and new work.

The end of the tap is chamfered into a **Pilot Point**. The lands are made with an extremely **Sharp Hook** which shears the chip instead of scraping it off. The reamer section is shorter than usual and is provided with a **Chip Breaker** which effectively prevents the formation of long, tightly curled chips. The threaded section is made with an extremely **Long Taper** thus dividing the work over a large number of teeth; consequently, less work is required of each tooth and the life of the tap is lengthened proportionately. Each tooth is made with a special **Relief**. This relief eliminates practically all friction on the sides of the teeth, although the tooth is left concentric for a considerable part of its width to permit sharpening without reducing the cutting size.

The "Maxi" Staybolt Tap

Patented July 31, 1917

(Continued)

Almost fifty years' experience in the manufacture of taps and dies has taught us how to harden and temper tools without seriously affecting the lead. "Maxi" Taps are warranted to hold their lead to the users' satisfaction.

All taps have 12 threads to the inch and will be furnished in either USS, Whitworth, or V form of thread.

USS Form threads furnished unless otherwise ordered.

"Maxi" Taps are regularly carried in stock in 20" and 24" lengths. Other lengths are special and subject to special prices.

If ordered in quantities of 12 or over, regular discounts apply.

Dimensions and Proportions—Inches

Total Length Inches	Square	Shank	Thread	Reamer
20	1"	6"	7½"	5½"
24	1"	8"	9"	6"

Other lengths are furnished in the same proportion.

Taps shorter than 16 inches will be charged as if 16 inches long, and fractions of an inch in length will be charged as a full extra inch.

Sizes and Prices

Diameter of Tap, Inches	Price per Inch	Diameter of Tap, Inches	Price per Inch
¾	\$.40	1⅜	\$.55
13/16	.40	1¼	.55
7/8	.40	1⅝	.60
15/16	.45	1⅜	.60
1	.45	17/16	.70
1⅛	.50	1½	.70
1⅜	.50		

Diameter given is that of the thread at its straight part.



Spindle Staybolt Taps

No. 1410



All taps have 12 threads to the inch and can be furnished in either USS or V form of thread.

USS Form threads furnished unless otherwise ordered.

Taps shorter than 8 inches will be charged as if 8 inches long, and fractions of an inch in length will be charged as a full extra inch.

Spindle Staybolt Taps having the following proportions are carried in stock for immediate shipment.

Length overall	7 $\frac{5}{8}$ "
Length of fluted thread	3 $\frac{1}{4}$ "
Length of unfluted thread	2 $\frac{3}{4}$ "
Diameter of spindle	$\frac{3}{8}$ "
Length of spindle	11"

Sizes and Prices

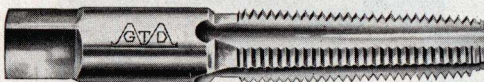
Diam. of Tap Inches	Price		Diam. of Tap Inches	Price	
	For a Tap 7 $\frac{5}{8}$ " Long	Per Inch for Other Lengths*		For a Tap 7 $\frac{5}{8}$ " Long	Per Inch for Other Lengths
$\frac{3}{4}$	\$8.00	\$1.00	1 $\frac{3}{16}$	\$10.80	\$1.35
1 $\frac{3}{16}$	8.40	1.05	1 $\frac{1}{4}$	11.20	1.40
$\frac{7}{8}$	8.80	1.10	1 $\frac{5}{16}$	11.60	1.45
1 $\frac{5}{16}$	9.20	1.15	1 $\frac{3}{8}$	12.00	1.50
1	9.60	1.20	1 $\frac{7}{16}$	12.40	1.55
1 $\frac{1}{16}$	10.00	1.25	1 $\frac{1}{2}$	12.80	1.60
1 $\frac{1}{8}$	10.40	1.30			

* Special discounts apply on these taps.

Straight and Taper Boiler Taps



Straight, No. 326



Taper, No. 317

Taper Boiler Taps have a taper of $\frac{3}{4}$ inch to the foot and the diameter is measured $\frac{5}{8}$ inch from the large end of the thread.

All taps have 12 threads to the inch and can be furnished in either USS or V form of thread.

USS Form threads furnished unless otherwise ordered.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

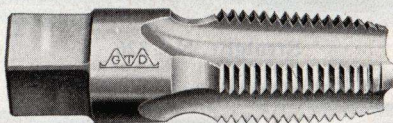
Sizes and Prices

Diameter of Tap Inches	Price Each	Length Overall Inches	Diameter of Tap Inches	Price Each	Length Overall Inches
$\frac{1}{2}$	\$1.05	$4\frac{1}{4}$	$1\frac{3}{16}$	\$3.85	7
$\frac{9}{16}$	1.25	$4\frac{5}{8}$	$1\frac{1}{4}$	4.05	$7\frac{1}{8}$
$\frac{5}{8}$	1.40	5	$1\frac{5}{16}$	4.35	$7\frac{1}{4}$
$\frac{11}{16}$	1.60	$5\frac{1}{4}$	$1\frac{3}{8}$	4.70	$7\frac{3}{8}$
$\frac{3}{4}$	1.95	$5\frac{1}{2}$	$1\frac{7}{16}$	5.30	$7\frac{1}{2}$
$\frac{13}{16}$	2.25	$5\frac{3}{4}$	$1\frac{1}{2}$	5.50	$7\frac{5}{8}$
$\frac{7}{8}$	2.50	6	$1\frac{5}{8}$	5.80	$7\frac{3}{4}$
$\frac{15}{16}$	2.80	$6\frac{1}{4}$	$1\frac{3}{4}$	6.10	$7\frac{7}{8}$
1	3.35	$6\frac{1}{2}$	$1\frac{7}{8}$	6.40	8
$1\frac{1}{16}$	3.50	$6\frac{3}{4}$	2	6.70	8
$1\frac{1}{8}$	3.65	$6\frac{7}{8}$			



Patch Bolt Taps

No. 318



All taps have 12 threads to the inch and can be furnished in either USS or V form of thread.

USS Form threads furnished unless otherwise ordered.

Patch Bolt Taps taper $\frac{3}{4}$ inch to the foot.

The diameter is measured $\frac{5}{8}$ inch from the large end of the thread.

Sizes, lengths and threads not listed are subject to special prices.

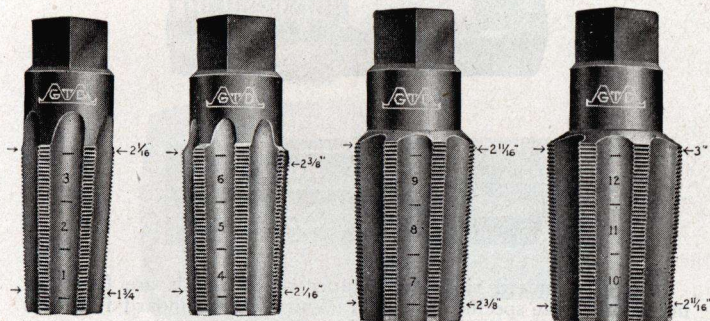
Left hand taps are special.

Sizes and Prices

Diameter of Tap Inches	Price Each	Length Overall Inches	Diameter of Tap Inches	Price Each	Length Overall Inches
$\frac{1}{2}$	\$1.00	3	$\frac{15}{16}$	\$2.40	$3\frac{1}{4}$
$\frac{9}{16}$	1.10	3	1	2.80	$3\frac{1}{2}$
$\frac{5}{8}$	1.25	3	$1\frac{1}{16}$	2.90	$3\frac{1}{2}$
$1\frac{1}{16}$	1.45	3	$1\frac{1}{8}$	3.00	$3\frac{1}{2}$
$\frac{3}{4}$	1.70	$3\frac{1}{4}$	$1\frac{3}{16}$	3.15	$3\frac{1}{2}$
$1\frac{1}{16}$	1.95	$3\frac{1}{4}$	$1\frac{1}{4}$	3.35	$3\frac{1}{2}$
$\frac{7}{8}$	2.25	$3\frac{1}{4}$			

Mud Plug or Washout Taps

No. 327



Used for tapping washout holes in locomotives.

A set consists of four taps having $1\frac{1}{4}$ inch taper in 12 inches.

Tap No. 1 is $1\frac{3}{4}$ inches in diameter at small end, and tap No. 4 is 3 inches in diameter at large end.

The taps are marked as shown in the illustrations and correspond with taper plugs bearing the same numbers as the twelve diameters shown in the four taps.

The taps are $6\frac{1}{2}$ inches long and all have the same size shank and square.

All taps have 12 threads to the inch, and can be furnished in either USS or V form of thread.

USS Form threads furnished unless otherwise ordered.

Sizes, lengths and threads not listed are subject to special prices.

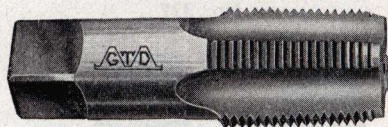
Left hand taps are special.

Sizes and Prices

No.	Capacity	For Plugs	Price Each
No. 1	$1\frac{3}{4}$ " — $2\frac{1}{16}$ "	Nos. 1, 2, 3	\$ 7.60
No. 2	$2\frac{1}{16}$ " — $2\frac{3}{8}$ "	Nos. 4, 5, 6	9.50
No. 3	$2\frac{3}{8}$ " — $2\frac{11}{16}$ "	Nos. 7, 8, 9	12.50
No. 4	$2\frac{11}{16}$ " — 3"	Nos. 10, 11, 12	14.45



Pipe Taps and Reamers



Briggs standard right hand taper pipe threads are furnished unless otherwise specified. British (Whitworth) standard furnished at regular prices. Both are machine relieved.

High speed steel pipe taps will be regularly furnished in Briggs Standard taper, right hand only. All other high speed steel pipe taps are special and subject to special prices.

Right and left hand pipe taps are furnished at the same list. Straight (plug) pipe taps will be furnished at regular prices. Pipe reamers furnished at the same list as the taps.

Pipe Size Inches	Price Each Taps or Reamers		Number of Threads to the Inch		Length of Thread Inches	Length Overall Inches
	Carbon Steel	High Speed Steel	Briggs Std.	Brit. Std.		
$\frac{1}{8}$	\$1.00	\$1.20	27	28	$\frac{3}{4}$	$2\frac{1}{8}$
$\frac{1}{4}$	1.20	1.80	18	19	$1\frac{1}{16}$	$2\frac{7}{16}$
$\frac{3}{8}$	1.60	2.60	18	19	$1\frac{1}{16}$	$2\frac{9}{16}$
$\frac{1}{2}$	2.00	4.00	14	14	$1\frac{3}{8}$	$3\frac{1}{8}$
$\frac{5}{8}$	2.80	**	..	14	$1\frac{3}{8}$	$3\frac{3}{16}$
$\frac{3}{4}$	2.80	6.00	14	14	$1\frac{3}{8}$	$3\frac{1}{4}$
$\frac{7}{8}$	4.40	**	..	14	$1\frac{9}{16}$	$3\frac{1}{2}$
1	4.40	9.00	$11\frac{1}{2}$	11	$1\frac{3}{4}$	$3\frac{3}{4}$
$1\frac{1}{4}$	5.00	14.00	$11\frac{1}{2}$	11	$1\frac{3}{4}$	4
$1\frac{1}{2}$	6.60	21.00	$11\frac{1}{2}$	11	$1\frac{3}{4}$	$4\frac{1}{4}$
$1\frac{3}{4}$	8.00	**	..	11	$1\frac{3}{4}$	$4\frac{3}{8}$
2	10.00	32.00	$11\frac{1}{2}$	11	$1\frac{3}{4}$	$4\frac{1}{2}$
$2\frac{1}{4}$	12.00	**	..	11	$2\frac{1}{8}$	5

All pipe taps and pipe reamers $\frac{1}{8}$ " to 1" inclusive are packed ten to the carton, $1\frac{1}{4}$ " and up are packed one to the carton.

** Prices on application.

Auto Pipe Tap Set No. 34 (in handy wooden box) containing $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ taper pipe taps. List price \$5.80.

Pipe Taps and Reamers

With Inserted Lands
For sizes larger than $2\frac{1}{4}$ inches

Patented Jan. 25, 1910

No. 321



This type of pipe tap and reamer has inserted lands of a superior quality of steel.

New lands may be obtained at a slight cost.

Briggs standard right hand taper pipe threads are furnished unless otherwise specified. British (Whitworth) standard furnished at regular prices.

Right and left hand pipe taps are furnished at the same list.

Straight pipe taps will be furnished at regular prices.

Pipe reamers furnished at the same list as the taps.

When ordering new lands, state cutting size desired.

Size Inches	Price Taps or Reamers	Pitch Briggs Std.	Pitch Brit. Std.	Length Thread Inches	Length Overall Inches	Price Per Set of Lands
$2\frac{1}{2}$	\$15.00	8	11	$2\frac{1}{2}$	5	\$6.50
$2\frac{3}{4}$	18.00		11	$2\frac{1}{2}$	5	7.00
3	22.50	8	11	$2\frac{1}{2}$	5	7.50
$3\frac{1}{4}$	25.50		11	$2\frac{5}{8}$	$5\frac{1}{2}$	7.50
$3\frac{1}{2}$	30.00	8	11	$2\frac{5}{8}$	$5\frac{1}{2}$	7.50
$3\frac{3}{4}$	36.00		11	$2\frac{5}{8}$	$5\frac{1}{2}$	8.50
4	45.00	8	11	$2\frac{5}{8}$	$5\frac{1}{2}$	8.50
$4\frac{1}{2}$	55.00	8	11	$2\frac{3}{4}$	6	9.00
5	65.00	8	11	$2\frac{3}{4}$	6	9.00
$5\frac{1}{2}$	75.00		11	$2\frac{3}{4}$	6	10.00
6	85.00	8	11	$2\frac{3}{4}$	$6\frac{1}{2}$	10.00

All tools catalogd are made to standard commercial tolerances.

For specials, see page 115.



Short Die Hobs

No. 312



USS threads furnished unless otherwise ordered.

SAE and Whitworth Standard threads furnished at regular prices if specified.

Short Die Hobs furnished exact size unless otherwise specified. Over or undersize hobs subject to special prices.

Sizes, lengths and threads not listed are subject to special prices.

Left hand hobs are special.

Sizes and Prices

Diam. of Hob Inches	Price Each	Number of Threads to the Inch			Length Overall Inches
		USS	SAE	Whit.	
$\frac{1}{4}$	\$.65	20	28	20	$2\frac{1}{2}$
$\frac{5}{16}$	.70	18	24	18	$2\frac{23}{32}$
$\frac{3}{8}$	.75	16	24	16	$2\frac{15}{16}$
$\frac{7}{16}$	.85	14	20	14	$3\frac{5}{32}$
$\frac{1}{2}$	1.00	13	20	12	$3\frac{3}{8}$
$\frac{9}{16}$	1.10	12	18	12	$3\frac{19}{32}$
$\frac{5}{8}$	1.25	11	18	11	$3\frac{13}{16}$
$\frac{11}{16}$	1.45	11	16	11	$4\frac{1}{32}$
$\frac{3}{4}$	1.70	10	16	10	$4\frac{1}{4}$
$\frac{13}{16}$	1.95	10	..	10	$4\frac{5}{32}$
$\frac{7}{8}$	2.25	9	14, 18	9	$4\frac{11}{16}$
$\frac{15}{16}$	2.50	9	..	9	$4\frac{29}{32}$
1	2.80	8	14	8	$5\frac{1}{8}$
$1\frac{1}{8}$	3.15	7	12	7	$5\frac{1}{16}$
$1\frac{1}{4}$	3.65	7	12	7	$5\frac{3}{4}$
$1\frac{3}{8}$	4.20	6	12	6	$6\frac{1}{16}$
$1\frac{1}{2}$	4.60	6	12	6	$6\frac{3}{8}$
$1\frac{5}{8}$	5.45	$5\frac{1}{2}$	..	5	$6\frac{11}{16}$
$1\frac{3}{4}$	5.80	5	..	5	7
$1\frac{7}{8}$	6.15	5	..	$4\frac{1}{2}$	$7\frac{5}{16}$
2	6.70	$4\frac{1}{2}$	..	$4\frac{1}{2}$	$7\frac{5}{8}$

Long Die Hobs

No. 313



USS threads furnished unless otherwise ordered.

SAE and Whitworth Standard threads furnished at regular prices if specified.

Long Die Hobs furnished exact size unless otherwise specified. Over or undersize hobs subject to special prices.

Sizes, lengths and threads not listed are subject to special prices.

Left hand hobs are special.

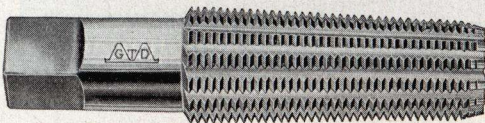
Sizes and Prices

Diam. of Hob In.	Price Each	Number of Threads to the Inch			Length Overall Inches
		USS	SAE	Whit.	
$\frac{1}{4}$	\$1.25	20	28	20	$4\frac{1}{16}$
$\frac{5}{16}$	1.35	18	24	18	$4\frac{9}{16}$
$\frac{3}{8}$	1.50	16	24	16	5
$\frac{7}{16}$	1.70	14	20	14	$5\frac{3}{8}$
$\frac{1}{2}$	1.90	13	20	12	$5\frac{3}{4}$
$\frac{9}{16}$	2.20	12	18	12	$6\frac{1}{8}$
$\frac{5}{8}$	2.50	11	18	11	$6\frac{5}{8}$
$\frac{11}{16}$	2.85	11	16	11	$7\frac{1}{8}$
$\frac{3}{4}$	3.20	10	16	10	$7\frac{5}{8}$
$\frac{13}{16}$	3.60	10	..	10	$8\frac{1}{8}$
$\frac{7}{8}$	4.00	9	14, 18	9	$8\frac{5}{8}$
$\frac{15}{16}$	4.50	9	..	9	9
1	5.00	8	14	8	$9\frac{1}{4}$
$1\frac{1}{8}$	5.75	7	12	7	$9\frac{9}{16}$
$1\frac{1}{4}$	6.50	7	12	7	$9\frac{7}{8}$
$1\frac{3}{8}$	7.50	6	12	6	$10\frac{1}{8}$
$1\frac{1}{2}$	8.50	6	12	6	$10\frac{1}{16}$
$1\frac{5}{8}$	9.75	$5\frac{1}{2}$	..	5	$10\frac{3}{4}$
$1\frac{3}{4}$	11.00	5	..	5	11
$1\frac{7}{8}$	12.50	5	..	$4\frac{1}{2}$	$11\frac{1}{4}$
2	14.00	$4\frac{1}{2}$	..	$4\frac{1}{2}$	$11\frac{1}{2}$



Pipe Hobs

No. 315



Briggs Standard right hand pipe hobs are furnished unless otherwise specified.

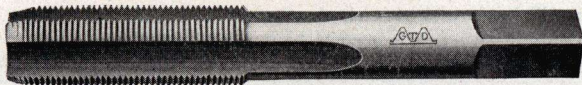
Sizes, lengths and threads not listed are subject to special prices.

Left hand hobs are special.

Sizes and Prices

Nominal Size Inches	Price Each	Number Threads to the Inch		Length of Thread, Inches	Length Overall Inches
		Briggs Std.	Whit. Std.		
$\frac{1}{8}$	\$1.75	27	28	2	$3\frac{1}{8}$
$\frac{1}{4}$	2.00	18	19	$2\frac{9}{16}$	$3\frac{13}{16}$
$\frac{3}{8}$	2.30	18	19	$2\frac{9}{16}$	$3\frac{15}{16}$
$\frac{1}{2}$	2.75	14	14	$2\frac{15}{16}$	$4\frac{9}{16}$
$\frac{5}{8}$	3.25	..	14	$2\frac{15}{16}$	$4\frac{13}{16}$
$\frac{3}{4}$	3.25	14	14	$2\frac{15}{16}$	$4\frac{13}{16}$
$\frac{7}{8}$	4.00	..	14	$3\frac{3}{8}$	$5\frac{1}{2}$
1	4.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{1}{2}$
$1\frac{1}{4}$	5.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{3}{4}$
$1\frac{1}{2}$	6.60	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{7}{8}$
$1\frac{3}{4}$	8.00	..	11	$3\frac{3}{8}$	6
2	10.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	6
$2\frac{1}{4}$	12.00	..	11	$4\frac{7}{16}$	$7\frac{3}{16}$
$2\frac{1}{2}$	12.00	8	11	$4\frac{7}{16}$	$7\frac{3}{16}$
$2\frac{3}{4}$	18.00	..	11	$4\frac{7}{16}$	$7\frac{3}{16}$
3	22.50	8	11	$4\frac{7}{16}$	$7\frac{3}{16}$
$3\frac{1}{4}$	25.50	..	11	$4\frac{7}{16}$	$7\frac{1}{16}$
$3\frac{1}{2}$	30.00	8	11	$4\frac{7}{16}$	$7\frac{1}{16}$
$3\frac{3}{4}$	36.00	..	11	$4\frac{7}{16}$	$7\frac{1}{16}$
4	45.00	8	11	$4\frac{7}{16}$	$7\frac{1}{16}$

Coupling Taps



Coupling Taps are furnished only with a form of thread and of a diameter suitable for tapping couplings for steam pipe or conduit.

Left hand taps are special.

Sizes and Prices

Nominal Size Inches	Price Each	Threads per Inch	Length Overall Inches	Dimensions of Square	
				Size	Length
$\frac{1}{8}$	\$.85	27	$6\frac{3}{8}$	$\frac{9}{32}$	$1\frac{1}{16}$
$\frac{1}{4}$	1.00	18	$6\frac{3}{8}$	$\frac{5}{16}$	$1\frac{1}{16}$
$\frac{3}{8}$	1.25	18	$6\frac{3}{8}$	$\frac{7}{16}$	$1\frac{1}{16}$
$\frac{1}{2}$	1.95	14	$6\frac{13}{16}$	$\frac{17}{32}$	$1\frac{5}{16}$
$\frac{3}{4}$	2.60	14	$7\frac{5}{16}$	$\frac{21}{32}$	$1\frac{5}{16}$
1	3.35	$11\frac{1}{2}$	$7\frac{7}{16}$	$\frac{13}{16}$	$1\frac{1}{2}$
$1\frac{1}{4}$	5.60	$11\frac{1}{2}$	$7\frac{3}{4}$	$1\frac{1}{16}$	$1\frac{3}{4}$
$1\frac{1}{2}$	6.40	$11\frac{1}{2}$	$7\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$
2	10.00	$11\frac{1}{2}$	$8\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$



Metric Hand Taps

Nos. 302-3-4

French and International Standard

Orders for hand taps to and including 8 mm. will be filled with taps having shanks full diameter of thread. Taps 9 mm. and larger will be furnished with shanks size of bottom of thread.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

For additional information regarding the Metric Screw Thread, pitches, etc., see page 346.

Sizes and Prices

Diameter of Tap mm.	Price		Std. Pitches mm.	
	Each	Per Set	French	International
2	\$.45	\$1.35	...	.45
2.5	.40	1.20	...	.45
3	.40	1.20	.5	.60
3.5	.35	1.05	...	.60
4	.35	1.05	.75	.75
4.5	.35	1.05	...	.75
5	.40	1.20	.75	.90
5.5	.40	1.20	...	.90
6	.45	1.35	1.0	1.0
7	.45	1.35	1.0	1.0
8	.50	1.50	1.0	1.25
9	.55	1.65	1.0	1.25
10	.55	1.65	1.5	1.5
11	.60	1.80	...	1.5
12	.70	2.10	1.5	1.75

(Continued)

International Pitches, in sizes 2 mm. to 5.5 mm. inclusive, are those adopted by The French Navy, Department of War, Railway Companies, etc., and approved by the Society for the Advancement of National Industries.



Metric Hand Taps

Nos. 302-3-4

French and International Standard

(Concluded)

Sizes and Prices

Diameter of Tap mm.	Price		Std. Pitches mm.	
	Each	Per Set	French	International
14	\$.80	\$2.40	2.0	2.0
16	.90	2.70	2.0	2.0
18	1.05	3.15	2.5*	2.5*
20	1.40	4.20	2.5	2.5
22	1.60	4.80	2.5	2.5
24	1.80	5.40	3.0	3.0
26	2.00	6.00	3.0	...
27	2.25	6.75	...	3.0
28	2.25	6.75	3.0	...
30	2.60	7.80	3.5	3.5
32	2.60	7.80	3.5	...
33	3.00	9.00	...	3.5
34	3.00	9.00	3.5	...
36	3.50	10.50	4.0	4.0
38	3.50	10.50	4.0	...
39	4.20	12.60	...	4.0
40	4.20	12.60	4.0	...
42	4.20	12.60	4.5	4.5
44	5.00	15.00	4.5	...
45	5.00	15.00	...	4.5
46	5.80	17.40	4.5	...
48	5.80	17.40	5.0	5.0
50	6.70	20.10	5.0	...

*Also furnished 1.5 mm.

All tools catalogd are made to standard commercial tolerances.

For specials, see page 115.



Metric Serial Hand Taps

No. 309

French and International Standard

Serial Hand Taps are furnished with shanks full size of thread from 6 mm. to 8 mm. inclusive and with shanks size of bottom of thread on 9 mm. and larger.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Sizes and Prices

Diameter of Tap mm.	Price		Standard Pitches mm.	
	Each	Per Set	French	International
6	\$.45	\$1.35	1.0	1.0
7	.45	1.35	1.0	1.0
8	.50	1.50	1.0	1.25
9	.55	1.65	1.0	1.25
10	.55	1.65	1.5	1.5
11	.60	1.80	...	1.5
12	.70	2.10	1.5	1.75
14	.80	2.40	2.0	2.0
16	.90	2.70	2.0	2.0
18	1.05	3.15	2.5	2.5
20	1.40	4.20	2.5	2.5
22	1.60	4.80	2.5	2.5
24	1.80	5.40	3.0	3.0
26	2.00	6.00	3.0	...
27	2.25	6.75	...	3.0
28	2.25	6.75	3.0	...
30	2.60	7.80	3.5	3.5
32	2.60	7.80	3.5	...
33	3.00	9.00	...	3.5
34	3.00	9.00	3.5	...
36	3.50	10.50	4.0	4.0
38	3.50	10.50	4.0	...



Metric Nut Taps

No. 306

French and International Standard

Sizes, lengths and threads not listed are subject to special prices.
Left hand taps are special.

Sizes and Prices

Diameter of Tap mm.	Price Each	Standard Pitches mm.	
		French	Inter- national
6	\$.60	1.0	1.0
7	.60	1.0	1.0
8	.70	1.0	1.25
9	.80	1.0	1.25
10	.80	1.5	1.5
11	.90	...	1.5
12	1.00	1.5	1.75
14	1.15	2.0	2.0
16	1.35	2.0	2.0
18	1.60	2.5	2.5
20	2.15	2.5	2.5
22	2.45	2.5	2.5
24	2.80	3.0	3.0
26	3.15	3.0	...
27	3.70	...	3.0
28	3.70	3.0	...
30	4.50	3.5	3.5
32	4.50	3.5	...
33	5.50	...	3.5
34	5.50	3.5	...
36	6.75	4.0	4.0
38	6.75	4.0	...
39	8.00	...	4.0
40	8.00	4.0	...
42	8.00	4.5	4.5
44	9.25	4.5	...
45	9.25	...	4.5
46	10.75	4.5	...
48	10.75	5.0	5.0
50	12.25	5.0	...

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.



Metric Tapper Taps

No. 307

French and International Standard

Tapper Taps will be furnished with plain round, squared, flatted, Acme, or National shanks at regular prices. All others will be considered special.

Sizes, lengths and threads not listed are subject to special prices. Left hand taps are special.

Sizes and Prices

Diam. of Tap mm.	Length Overall—Price Each				Std. Pitches mm.	
	11"	12"	14"	15"	French	Inter- national
6	\$.70	\$.75	\$.80	...	1.0	1.0
7	.70	.75	.80	...	1.0	1.0
8	.80	.85	.90	...	1.0	1.25
9	.90	.95	1.00	\$1.10	1.0	1.25
10	.90	.95	1.00	1.10	1.5	1.5
11	1.00	1.05	1.15	1.25	...	1.5
12	1.10	1.15	1.25	1.35	1.5	1.75
14	1.30	1.35	1.45	1.55	2.0	2.0
16	1.45	1.50	1.65	1.75	2.0	2.0
18	...	1.70	1.80	1.95	2.5	2.5
20	...	2.20	2.25	2.35	2.5	2.5
22	...	2.50	2.60	2.75	2.5	2.5
24	...	2.90	3.00	3.15	3.0	3.0
26	...	3.30	3.50	3.65	3.0	...
27	...	...	4.00	4.15	...	3.0
28	...	...	4.00	4.15	3.0	...
30	...	...	4.90	5.10	3.5	3.5
32	...	...	4.90	5.10	3.5	...
33	...	...	5.75	6.00	...	3.5
34	...	...	5.75	6.00	3.5	...
36	...	...	7.05	7.35	4.0	4.0
38	...	...	7.05	7.35	4.0	...

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.



Metric Short Die Hobs

No. 312

French and International Standard

Sizes, lengths and threads not listed are subject to special prices.
Left hand hobs are special.

Sizes and Prices

Diam. of Hob mm.	Price Each	Standard Pitches mm.		Diam. of Hob mm.	Price Each	Standard Pitches mm.	
		French	Inter- nat'l			French	Inter- nat'l
6	\$.65	1.0	1.0	22	\$2.25	2.5	2.5
7	.65	1.0	1.0	24	2.50	3.0	3.0
8	.70	1.0	1.25	26	2.80	3.0	...
9	.75	1.0	1.25	27	3.15	...	3.0
10	.75	1.5	1.5	28	3.15	3.0	...
11	.85	...	1.5	30	3.65	3.5	3.5
12	1.00	1.5	1.75	32	3.65	3.5	...
14	1.10	2.0	2.0	33	4.20	...	3.5
16	1.25	2.0	2.0	34	4.20	3.5	...
18	1.45	2.5	2.5	36	4.60	4.0	4.0
20	1.95	2.5	2.5	38	4.60	4.0	...

Metric Long Die Hobs

No. 313

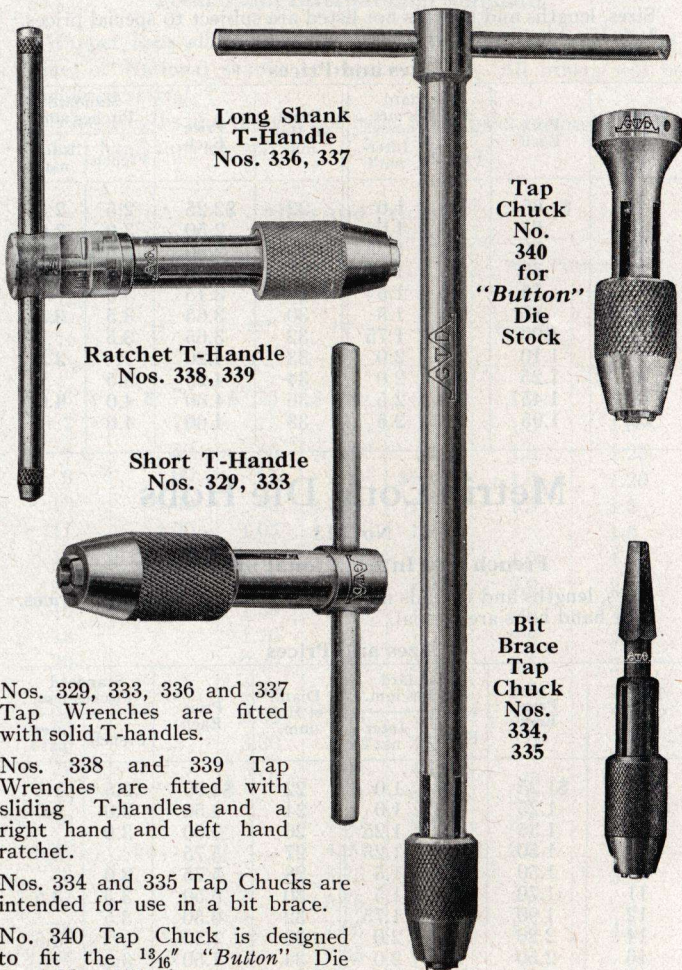
French and International Standard

Sizes, lengths and threads not listed are subject to special prices.
Left hand hobs are special.

Sizes and Prices

Diam. of Hob mm.	Price Each	Standard Pitches mm.		Diam. of Hob mm.	Price Each	Standard Pitches mm.	
		French	Inter- nat'l			French	Inter- nat'l
6	\$1.25	1.0	1.0	22	\$4.00	2.5	2.5
7	1.25	1.0	1.0	24	4.50	3.0	3.0
8	1.35	1.0	1.25	26	5.00	3.0	...
9	1.50	1.0	1.25	27	5.75	...	3.0
10	1.50	1.5	1.5	28	5.75	3.0	...
11	1.70	...	1.5	30	6.50	3.5	3.5
12	1.90	1.5	1.75	32	6.50	3.5	...
14	2.20	2.0	2.0	33	7.50	...	3.5
16	2.50	2.0	2.0	34	7.50	3.5	...
18	2.85	2.5	2.5	36	8.50	4.0	4.0
20	3.60	2.5	2.5	38	8.50	4.0	...

Adjustable Tap and Reamer Wrenches and Chucks



**Long Shank
T-Handle**
Nos. 336, 337

Ratchet T-Handle
Nos. 338, 339

Short T-Handle
Nos. 329, 333

**Tap
Chuck
No.
340
for
"Button"
Die
Stock**

**Bit
Brace
Tap
Chuck
Nos.
334,
335**

Nos. 329, 333, 336 and 337 Tap Wrenches are fitted with solid T-handles.

Nos. 338 and 339 Tap Wrenches are fitted with sliding T-handles and a right hand and left hand ratchet.

Nos. 334 and 335 Tap Chucks are intended for use in a bit brace.

No. 340 Tap Chuck is designed to fit the $1\frac{3}{16}$ " "Button" Die Stock No. 1851, shown on page 139. Specifications and prices on following page.

Adjustable Tap and Reamer Wrenches



Nos. 00 to 7



Nos. 7½ and 8

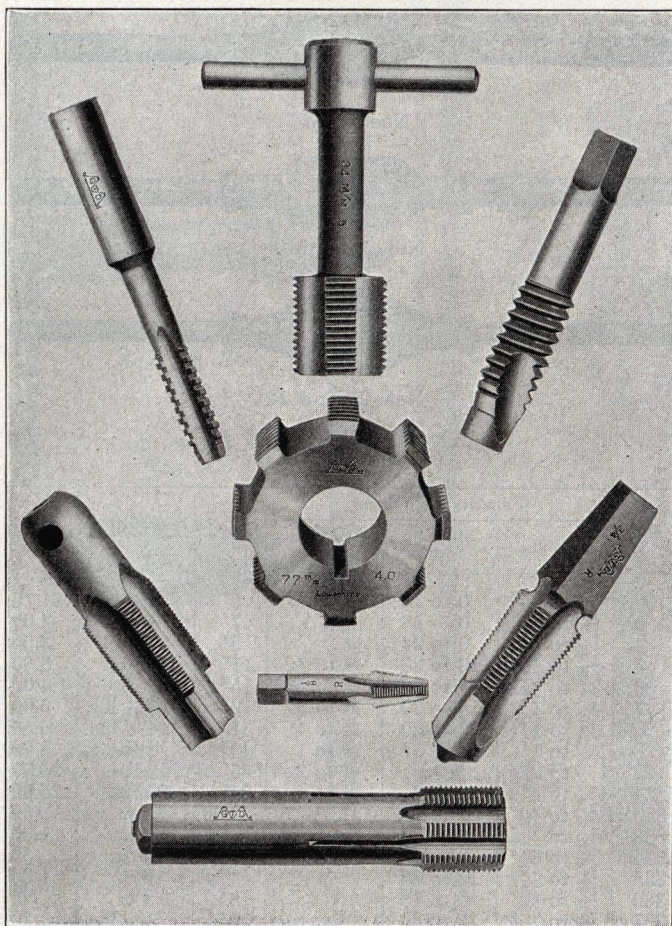


Nos. 22 and 24

Sizes and Prices

No.	Capacity (Tap Sizes)			Length	Weight	Price
	Hand	Machine Screw	Pipe			
00	1/16 to 3/16"	0 to 13	.....	5"	1 1/2 oz.	\$1.75
0	1/16 to 1/4"	0 to 18	.....	7"	4 oz.	2.00
4	1/16 to 3/8"	0 to 24	1/8	9"	7 oz.	3.00
5	3/16 to 1/2"	10 to 30	1/8 to 1/4	11"	12 oz.	3.50
6	1/4 to 3/4"	14 to 30	1/8 to 3/8	15"	2 lbs.	4.00
7	3/8 to 1"	15 to 30	1/8 to 3/4	19"	3 1/2 lbs.	5.00
7 1/2	3/8 to 1 1/4"	22 to 30	1/4 to 3/4	31"	4 1/2 lbs.	6.50
8	3/4 to 1 1/2"	.....	3/8 to 1	40"	8 lbs.	8.00
22	1 to 2 5/8"	.....	1 to 2	55"	12 lbs.	15.00
24	1 3/4 to 4"	.....	2 to 4	74"	25 lbs.	25.00
329	1/16 to 9/32"	0 to 18	.....	2 1/2"	3 oz.	.50
333	7/32 to 1/2"	12 to 30	1/8	3 5/8"	8 oz.	1.00
334	1/16 to 9/32"	0 to 18	.....	3 3/4"	2 oz.	.50
335	7/32 to 1/2"	12 to 30	1/8	4 7/8"	6 oz.	1.00
336	1/16 to 9/32"	0 to 18	.....	8 3/4"	8 oz.	.75
337	7/32 to 1/2"	12 to 30	1/8	10 5/8"	1 1/4 lbs.	1.50
338	1/16 to 9/32"	0 to 18	.....	4"	6 oz.	1.00
339	7/32 to 1/2"	12 to 30	1/8	4 5/8"	11 oz.	2.00
340	1/16 to 9/32"	0 to 18	.....	2 5/8"	3 oz.	.50

A Few GTD Special Taps



Special Taps

Tools shown in this catalog are made to standard commercial tolerances and orders will be so filled unless otherwise specified.

Our facilities for manufacturing special goods have been enlarged and improved. We are prepared to quote on special taps, dies, reamers, twist drills, or other small tools of carbon or high speed steel.

Our experience together with our engineering facilities, always at your disposal, will help you to solve any screw threading difficulties.

Where inquiries or orders are not accompanied by drawings, we require complete specifications covering all features, such as:

Type of tap

Nominal size (outside diameter)

Pitch or number of threads per inch

Pitch Diameter

Form of thread

Length overall, length of thread, size of shank and square

If Serial Taps are ordered, give diameter of each tap

If ordering Double, Triple or Quadruple thread, be sure to give both pitch and lead:

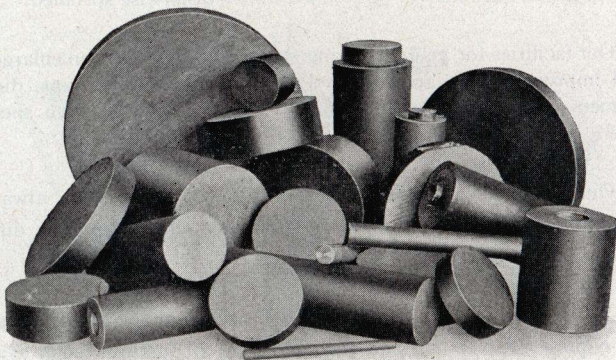
as $\frac{1}{2}$ -20 Pitch 10 lead Double

as $\frac{3}{8}$ -18 Pitch 6 lead Triple

Full information covering conditions under which the tool is to be used will assist in the design of a tool best adapted for the work

Where tolerances are not specified, we will work to our regular limits.

Tool Steel



Conveniently packed in strong shipping cases and ready for immediate shipment.

Net weight 100 lbs.
F. O. B. Greenfield, Mass. \$11.00

As a result of numerous requests, we have for sale large quantities of the finest grade tool steel, in a large assortment of shapes and sizes. This stock consists of ends of square, round or hex. bars of perfectly annealed high speed steel, carbon steel, fine quality screw stock and tap steel, remaining over from the manufacture of small tools. The pieces range in diameter from about $\frac{5}{16}$ " to 3". The smaller diameters run from about $1\frac{1}{2}$ " to 4" in length.

This stock is adaptable to a variety of purposes. Operators of machine shops, millwrights, farmers, blacksmiths, and garage owners are in constant need of just such pieces for all kinds of emergency repair jobs. They can be used in making punches, dies, keys, taper pins and many sorts of tools.

DIE SECTION

Dies
Die Stocks
Die Holders
Collets

DIES

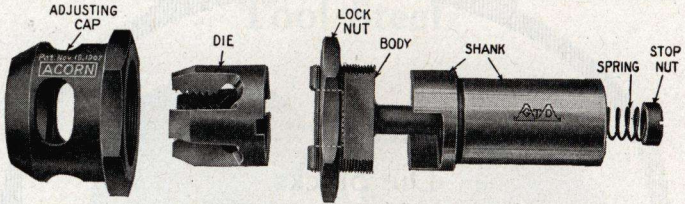
	Pages		Pages
"Acorn"	118-122	"Little Giant"	126-129
Adjustable Round	142-149	"OK"	141
"Green River"	136, 137	Self Opening	123-125
Hexagon	152, 153	Spring	150, 151
"Lightning"	132, 133	Square Bolt	154

STOCKS

Adjustable Round Split Die.	139	"Lightning"	134, 138
Bushings, Adjustable Round		"Little Giant"	130, 131
Die	150	"OK"	140
Holdings, Adjustable Round		Pump Makers	135
Die	147		

The "Acorn" Die and Holders

Patented Jan. 16, 1917

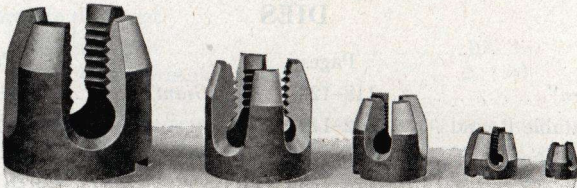


The "Acorn" Die, by means of its several styles of holders, is adapted to all kinds of machines: lathes, drill presses, hand or automatic screw machines, turret lathes, bolt cutters, etc.

The adjusting cap is bevelled on the inside to fit the corresponding bevel on the prongs of the die. By turning this threaded cap the correct adjustment is instantly obtained, all the prongs converging equally toward the center.

When the adjustment is correct the cap is held in position by the lock nut immediately back of it.

The die is held in perfect alignment with the shank. The dies are uniform in length. This means that once a machine is set, a die may be removed for sharpening, a new die set in its place and the machine is ready at once for threading to exactly the same length. (Continued on next page.)



"Acorn" Dies

In ordering dies, specify both number and cutting size. Sizes and pitches regularly furnished shown on page 122.

No. of Die	Price Each	Capacity				Diam. Blank Inches	Length Inches
		Machine Screw	Fractional	Pipe	Brit. Ass'n.		
0	\$2.40	0-3	$\frac{1}{16}$ - $\frac{7}{64}$		6-12	$\frac{3}{8}$	$\frac{23}{64}$
1	2.20	4-12	$\frac{1}{8}$ - $\frac{15}{64}$		0-5	$\frac{5}{8}$	$\frac{31}{64}$
2	2.60	14-22	$\frac{1}{4}$ - $\frac{23}{64}$			$\frac{7}{8}$	$\frac{55}{64}$
3	3.00	24-30	$\frac{3}{8}$ - $\frac{39}{64}$	$\frac{1}{8}$ - $\frac{1}{4}$		$1\frac{1}{4}$	$1\frac{13}{16}$
4	4.00		$\frac{5}{8}$ -1	$\frac{3}{8}$ - $\frac{3}{4}$		$1\frac{3}{4}$	$1\frac{121}{32}$
*5	12.00		$1\frac{1}{16}$ - $1\frac{1}{2}$	1"		$2\frac{5}{32}$	$1\frac{5}{8}$

*Holder for No. 5 Dies shown on page 121.

Grinding

The "Acorn" Die is the easiest and simplest to sharpen of any of the spring type of die. A folder giving instructions on the grinding and care of the "Acorn" Die will be furnished on request.

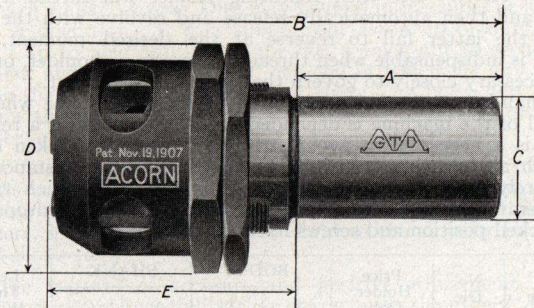
Holders

All parts of the holders are made of steel and hardened.

The bevelled surfaces of both cap and die are ground to gauges, insuring perfect contact of the bevels and a high degree of accuracy in adjustment.

Different types of holders are furnished to adapt the "Acorn" Die to all machines on which any form of die may be used. Six sizes of die blanks permit the cutting of all diameters from $\frac{1}{16}$ inch to $1\frac{1}{2}$ inches.

Regular "Acorn" Die Holders

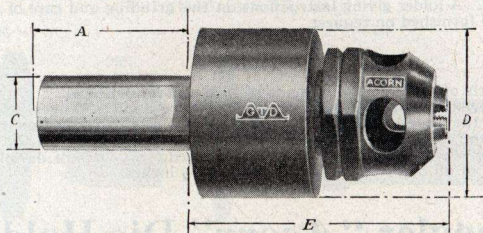


The regular "Acorn" Die Holder shown above takes the place of Nos. 700-704 and Nos. 740-744. It is of a smaller diameter than any other die holder of equal cutting size. It has a longitudinal float, permitting the die to follow its own lead independent of any lag in the travel of the machine.

This holder may be used effectively on practically all automatic screw machines and any other machines which provide for automatically reversing the die or rod at the instant when the desired length of thread has been cut.

No. Holder	No. Die	Price Holder Only	Dimensions of Body and Shank, Inches					Length Thread Will Cut Inches		
			A		B	C	D		E	
710	0	\$4.00	1 ³ / ₄ 2 ¹ / ₂	2	2 ⁴⁷ / ₆₄ 3 ³¹ / ₆₄	2 ⁶³ / ₆₄	⁵ / ₈ ³ / ₄	⁷ / ₈ ⁷ / ₈	⁶³ / ₆₄ ⁶³ / ₆₄	⁷ / ₈
711	1	6.00	1 ³ / ₈ 1 ³ / ₄	2 ³ / ₈	2 ⁵¹ / ₆₄ 3 ¹¹ / ₆₄	3 ⁵¹ / ₆₄	⁵ / ₈ ³ / ₄	1 ⁵ / ₃₂ 1 ⁵ / ₃₂	1 ²⁷ / ₆₄ 1 ²⁷ / ₆₄	⁷ / ₈
712	2	8.00	1 ¹ / ₄ 1 ³ / ₄ 2 ³ / ₄ 2 ³ / ₄	3 ³ / ₄	3 ⁷ / ₆₄ 3 ³⁹ / ₆₄ 4 ³⁹ / ₆₄ 4 ³⁹ / ₆₄	5 ³⁹ / ₆₄	⁵ / ₈ ³ / ₄ ⁷ / ₈ 1	1 ⁷ / ₁₆ 1 ⁷ / ₁₆ 1 ⁷ / ₁₆ 1 ⁷ / ₁₆	1 ⁵⁵ / ₆₄ 1 ⁵⁵ / ₆₄ 1 ⁵⁵ / ₆₄ 1 ⁵⁵ / ₆₄	1 ¹ / ₈
713	3	10.00	2 ¹ / ₄ 2 ¹ / ₂ 2 ³ / ₄	3 ⁷ / ₈ 3 ⁷ / ₈	4 ⁹ / ₁₆ 4 ¹³ / ₁₆ 5 ¹ / ₁₆	6 ³ / ₁₆ 6 ³ / ₁₆	³ / ₄ 1 1 ¹ / ₄	2 ⁵ / ₁₆ 2 ⁵ / ₁₆ 2 ⁵ / ₁₆	2 ⁵ / ₁₆ 2 ⁵ / ₁₆ 2 ⁵ / ₁₆	1 ¹ / ₂
714	4	15.00	2 ¹ / ₈ 2 ⁷ / ₈ 2 ⁷ / ₈	4 ¹ / ₂ 4 ¹ / ₂	5 ⁵ / ₃₂ 5 ²⁹ / ₃₂ 5 ²⁹ / ₃₂	7 ¹⁷ / ₃₂ 7 ¹⁷ / ₃₂	1 1 ¹ / ₄ 1 ¹ / ₂	2 ⁷ / ₈ 2 ⁷ / ₈ 2 ⁷ / ₈	3 ¹ / ₃₂ 3 ¹ / ₃₂ 3 ¹ / ₃₂	2

Releasing "Acorn" Die Holder



The "Acorn" Die with Releasing Holder will thread a given length and then automatically release and revolve with the work, should the latter fail to reverse at the desired moment. This feature is indispensable when threading close to a shoulder, or when it is necessary closely to govern the length of thread cut.

In hand screw machines, or in any others of a type where the reversal of the machine is dependent upon the operator, a releasing holder is a necessity to avoid stripped threads or broken dies.

With a Releasing "Acorn" Die, under like circumstances, the die merely spins in its holder with the work until such time as the operator reverses it. Then the die automatically drops back into locked position and screws itself off the work.

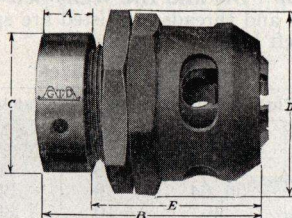
No. Holder	No. Die	Price Holder Only	BODY		SHANK		Length Thread Will Cut
			E	D	A	C	
720	0	\$ 9.00	$1\frac{15}{16}$	$1\frac{1}{4}$	$\left\{ 1\frac{1}{4} \right.$	$\frac{1}{2}$	No Limit
					$\left\{ 1\frac{1}{4} \right.$	$\frac{5}{8}$	No Limit
					$\left\{ 1\frac{1}{8} \right.$	$\frac{1}{2}$	No Limit
721	1	11.00	$2\frac{13}{16}$	$1\frac{5}{8}$	$\left\{ 1\frac{1}{4} \right.$	$\frac{5}{8}$	No Limit
					$\left\{ 2 \right.$	$\frac{3}{4}$	No Limit
					$\left\{ 1\frac{1}{4} \right.$	$\frac{5}{8}$	No Limit
					$\left\{ 1\frac{1}{2} \right.$	$\frac{3}{4}$	No Limit
722	2	14.00	$2\frac{3}{4}$	2	$\left\{ 2 \right.$	$\frac{7}{8}$	No Limit
					$\left\{ 3 \right.$	1	No Limit
					$\left\{ 1\frac{1}{2} \right.$	$\frac{3}{4}$	*
723	3	18.00	$3\frac{9}{16}$	$2\frac{1}{2}$	$\left\{ 2\frac{1}{4} \right.$	1	No Limit
					$\left\{ 3 \right.$	$1\frac{1}{4}$	No Limit
					$\left\{ 1\frac{3}{4} \right.$	1	**
724	4	24.00	$4\frac{1}{2}$	$3\frac{3}{16}$	$\left\{ 1\frac{3}{4} \right.$	$1\frac{1}{4}$	**
					$\left\{ 1\frac{3}{4} \right.$	$1\frac{1}{2}$	No Limit
					$\left\{ 3\frac{1}{4} \right.$	$1\frac{1}{2}$	No Limit

* No. 723— $\frac{3}{4}$ in. shank limited to $2\frac{7}{8}$ in. when cutting $\frac{11}{16}$ in. and larger. Unlimited under $\frac{11}{16}$ in.

** No. 724—1 in. shank limited to $3\frac{1}{2}$ in. when cutting $\frac{5}{8}$ in. and larger. Unlimited under $\frac{5}{8}$ in. $1\frac{1}{4}$ in. shank limited to $3\frac{1}{2}$ in. when cutting $\frac{7}{8}$ in. and larger. Unlimited under $\frac{7}{8}$ in.

For range of cutting sizes, see page 122.

The "Acorn" Die Adapter



The "Acorn" Die Adapter is, as its name implies, an appliance by means of which "Acorn" Dies may be used in machines or holders already in operation. It is a simple tool made up of only three parts, a Cap to hold and adjust the die, a Lock-nut to secure the adjustment and a threaded Body, one end of which fits any round or spring die holder of corresponding size. The body and shank are hollow to permit the cutting of any length of thread, provided the holder or machine will permit.

The "Acorn" Die Adapter is not designed to take the place of either the regular or the releasing holder, but furnishes an excellent means of using "Acorn" Dies with button, spring or floating die holders, in fact, just the sort of holders that are to be found in every shop.

All the features of accurate and positive adjustment, quick removal and interchangeability that characterize the other "Acorn" Die Holders apply to the "Acorn" Die Adapter.

No. Adapter	No. Die	Price	DIMENSIONS					Length Thread Will Cut
			C	A	D	E	B	
780	0	\$3.00	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{7}{8}$	$2\frac{5}{32}$	$1\frac{1}{32}$	No Limit
781	1	4.00	$\frac{5}{8}$	$\frac{1}{4}$	$1\frac{5}{32}$	$3\frac{1}{32}$	$1\frac{7}{32}$	No Limit
			$1\frac{13}{16}$	$\frac{9}{32}$	$1\frac{5}{32}$	$3\frac{1}{32}$	$1\frac{1}{4}$	No Limit
			1"	$\frac{3}{8}$	$1\frac{5}{32}$	$3\frac{1}{32}$	$1\frac{11}{32}$	No Limit
			$1\frac{13}{16}$	$\frac{9}{32}$	$1\frac{3}{4}$	$1\frac{19}{32}$	$1\frac{7}{8}$	No Limit
782	2	5.00	1"	$\frac{3}{8}$	$1\frac{3}{4}$	$1\frac{19}{32}$	$1\frac{31}{32}$	No Limit
			$1\frac{1}{4}$	$\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{1}{16}$	No Limit
			$1\frac{1}{2}$	$\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{1}{16}$	No Limit
			$1\frac{5}{8}$	$\frac{9}{16}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$2\frac{1}{8}$	No Limit
783	3	7.50	$1\frac{1}{4}$	$\frac{1}{2}$	$2\frac{5}{32}$	$2\frac{1}{32}$	$2\frac{17}{32}$	No Limit
			$1\frac{1}{2}$	$\frac{1}{2}$	$2\frac{5}{32}$	$2\frac{1}{32}$	$2\frac{17}{32}$	No Limit
			$1\frac{5}{8}$	$\frac{9}{16}$	$2\frac{5}{32}$	$2\frac{1}{32}$	$2\frac{19}{32}$	No Limit
			2	$\frac{5}{8}$	$2\frac{5}{32}$	$2\frac{1}{32}$	$2\frac{21}{32}$	No Limit
784	4	10.00	2	$\frac{5}{8}$	$2\frac{7}{8}$	$2\frac{11}{16}$	$3\frac{5}{16}$	No Limit
785	5	25.00	$4\frac{1}{2}$	1	$3\frac{5}{8}$	$2\frac{29}{32}$	$3\frac{29}{32}$	No Limit

For range of cutting sizes, see page 122.



Regular Sizes and Pitches

for the "Acorn" Die and the Wells Self-Opening Die

Sizes, dimensions and threads not listed are special and subject to special prices. Left hand dies are special.

Machine Screw Sizes

Screw Gage No.	Number of Threads to Inch		Screw Gage No.	Number of Threads to Inch	
	A.S.M.E. Standard	Also Furnished		A.S.M.E. Standard	Also Furnished
0	80		8	36	30, 32, 40
1	72	56, 64	9	32	24, 30
2	64	56	10	30	24, 28, 32
3	56	48	12	28	24, 32
4	48	32, 36, 40	14	24	20
5	44	36, 40	16	22	18, 20
6	40	32, 36	18	20	18
7	36	30, 32	20	20	16, 18

Fractional Sizes

USS threads furnished unless otherwise ordered.

Cutting Size In.	Number of Threads to Inch				Cutting Size In.	Number of Threads to Inch			
	Standard Pitches			USF Threads Also Furnished		Standard Pitches			USF Threads Also Furnished
	USS Std.	SAE Std.	Whit. Std.			USS Std.	SAE Std.	Whit. Std.	
$\frac{1}{16}$	64		60	72	$\frac{9}{16}$	12	18	12	27
$\frac{5}{64}$	60			72	$\frac{5}{8}$	11	18	11	12, 27
$\frac{3}{32}$	50		48	48	$\frac{11}{16}$	11	16	11	
$\frac{7}{64}$	48				$\frac{3}{4}$	10	16	10	12, 27
$\frac{1}{8}$	40		40	32	$\frac{13}{16}$	10		10	
$\frac{9}{64}$	40				$\frac{7}{8}$	9	14, 18	9	12, 27
$\frac{5}{32}$	36		32	32	$\frac{15}{16}$	9		9	
$\frac{11}{64}$	32				1	8	14	8	12, 27
$\frac{3}{16}$	24		24	32	$1\frac{1}{8}$	7	12	7	
$\frac{13}{64}$	24		24		$1\frac{1}{4}$	7	12	7	
$\frac{7}{32}$	24		24	32	$1\frac{3}{8}$	6	12	6	
$\frac{15}{64}$	24		24		$1\frac{1}{2}$	6	12	6	
$\frac{1}{4}$	20	28	20	24, 27, 32	$1\frac{5}{8}$	$5\frac{1}{2}$		5	
$\frac{5}{16}$	18	24	18	20, 27, 32	$1\frac{3}{4}$	5		5	
$\frac{3}{8}$	16	24	16	20, 27	$1\frac{7}{8}$	5		$4\frac{1}{2}$	
$\frac{7}{16}$	14	20	14	24, 27	2	$4\frac{1}{2}$		$4\frac{1}{2}$	
$\frac{1}{2}$	13	20	12	12, 24, 27					

Pipe Sizes: Briggs standard right hand threads furnished unless otherwise specified. Whitworth threads (right hand) furnished at regular prices. Left hand threads are special.

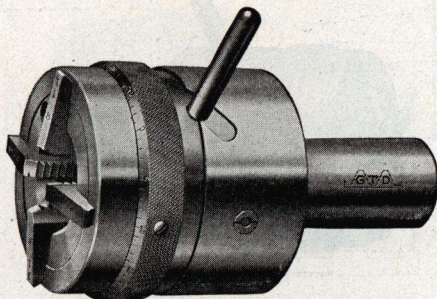
Cuttings sizes, "Acorn" Die $\frac{1}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ".

Cutting sizes, W.S.O.D. $\frac{1}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1 ", $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", $1\frac{3}{4}$ ", 2 ".

Fine Pitch for Brass: American standard (all 27 straight threads) right hand dies furnished unless otherwise specified. British standard (26 threads) furnished at regular prices. Cutting sizes, $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{9}{16}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", $\frac{7}{8}$ ", 1 ".

Wells Self-Opening Die

Patented August 2, 1910

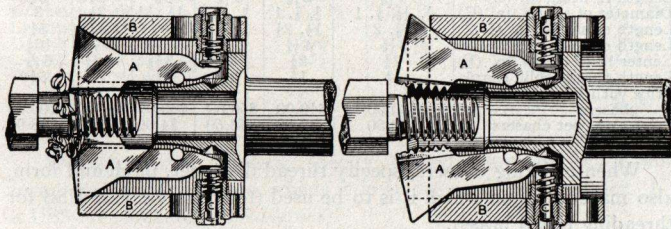


Model B

The Wells Self-Opening Die avoids the faults which hitherto have characterized automatic opening dies and presents the following advantages:

Chasers readily removed or replaced, permitting them to be sharpened easily and quickly. Removal of chasers does not disturb setting or adjustment of die head. Chips fall in front of, not in the die, preventing delays due to clogging. No obstruction in front of lands, enabling thread to cut to shoulder. Chasers may be re-ground many times.

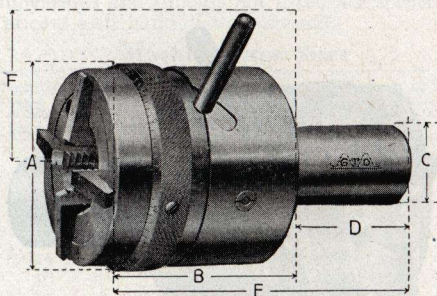
These chasers are of ample proportions and are formed so that they fit snugly within their slots in the die head. This positive support holds them rigid, and their generous depth and length prevent chattering and the development of any side twist.



Die Closed—Chasers in Position for Cutting.

Die Open—Chasers Disengaged to Permit Drawing Off the Work.

Model B---Pull Trip



Model B was especially designed for use on Brown & Sharpe Automatic Screw Machines for which it is admirably adapted. It is equally successful on practically all styles of machines on which threading can be done.

This model is equipped with a pull trip to avoid the need of rigging stops on the machine. The pull trip permits a certain amount of float in the die head. The closing lever operates with a helical motion.

Stocked in solid shank. Hollow shank substituted without extra charge. Hollow shank will permit any length of thread.

Specifications

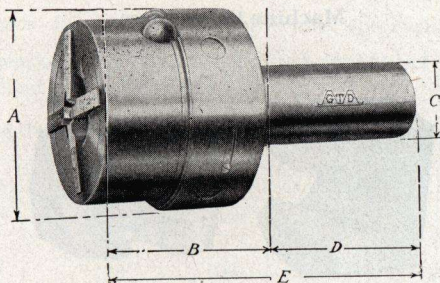
Number of Die	880	881	882	883	884	885
Capacity, bolt threads, in.	{ 0 to $\frac{1}{4}$ }	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to 2
Capacity, pipe threads, in.	{ 0 to 10 BA }	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{3}{8}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{1}{2}$
Diameter of head, in. (A)	2	$2\frac{7}{8}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$5\frac{1}{8}$	6
Length of head, in. (B)	$1\frac{11}{16}$	$2\frac{7}{8}$	$3\frac{11}{16}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{1}{4}$
Diameter of shank, in. (C)	$\frac{3}{8}, \frac{11}{16}, \frac{1}{2}, 1$	$\frac{3}{4}, \frac{1}{2}, 1$	$1, 1\frac{1}{4}$	$1\frac{1}{2}, 1\frac{1}{2}$	$2\frac{1}{2}$	3
Length of shank, in. (D)	$1\frac{1}{2}, 2$	$1\frac{1}{2}, 2\frac{1}{2}$	3	3	$4\frac{1}{2}$	$5\frac{1}{2}$
Length overall, in. (E)	$3\frac{11}{16}$	$4\frac{11}{16}$	$6\frac{3}{16}$	$6\frac{3}{8}$	$9\frac{1}{8}$	$10\frac{1}{2}$
Center head to tip, in. (F)	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{11}{16}$	$5\frac{11}{16}$	$6\frac{1}{8}$
Length thread solid shank	$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	4	$5\frac{1}{4}$
Price with 1 set alloy steel chasers	\$30.00	\$40.00	\$50.00	\$60.00	\$80.00	\$100.00
Price extra set chasers	\$2.50	\$3.00	\$3.50	\$4.00	\$6.00	\$8.00

When ordering chasers, specify thread diameter, pitch and form, also material upon which it is to be used (for instance 1"-8 USS for threading rolled brass).

Sizes and pitches regularly furnished shown on page 122.

Special shanks furnished at a 5% increase in price.

Model T --- Rim Trip



Model T is designed for all machines where the die revolves, such as drill presses, multiple spindle screw machines, bolt cutters, etc.

This model is closed by having a "yoke" push the outer shell forward, after the die backs off the work, or by a stop bearing on one side only.

Stocked in solid shank. Hollow shank substituted without extra charge. Hollow shank will permit the cutting of any length of thread.

Specifications

Number of Die	840	841	842	843
Capacity, bolt threads, in.	{ 0 to 1/4 0 to 10 BA }	1/8 to 1/2	1/4 to 3/4	3/8 to 1
Capacity, pipe threads, in.		1/8, 1/4	1/8 to 3/8	1/4 to 3/4
Diameter of head, in. (A)	2 1/4	2 1/2	3 1/8	3 7/8
Length of head, in. (B)	1 13/16	2 1/16	2 11/16	2 5/8
Diameter of shank, in. (C)	5/8, 3/4, 7/8	3/4, 7/8, 1	1, 1 1/4	1 1/4, 1 1/2
Length of shank, in. (D)	2	2 1/2	3	3 1/4
Length overall, in. (E)	3 3/8	4 1/2	5 3/4	6 3/4
Length thread, solid shank	1 1/2	1 1/2	2 1/2	2 1/2
Price with 1 set alloy steel chasers	\$25.00	\$35.00	\$45.00	\$55.00
Price extra set chasers	\$2.50	\$3.00	\$3.50	\$4.00

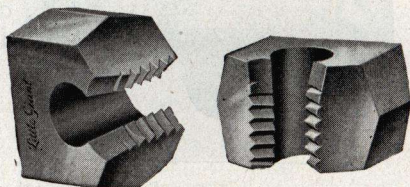
When ordering chasers, specify thread diameter, pitch and form, also material upon which it is to be used (for instance, 1"-8 USS for threading rolled brass).

Sizes and pitches regularly furnished shown on page 122.

Special shanks furnished at a 5% increase in price.

Little Giant Adjustable Dies

Reversible
Machine Screw Sizes



Patented February 23, 1915

We recommend the adoption of the A.S.M.E. standard.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Screw Gage No.	Diameter Collet Price Dies for Each Size		Number of Threads to the Inch	
	1¼"	1⅝"	A.S.M.E. Standard	Also Furnished
2	\$.75		64	56
3	.75		56	48
4	.75		48	32, 36, 40
5	.75		44	36, 40
6	.75		40	32, 36
7	.75		36	30, 32
8	.75		36	30, 32, 40
9	.75		32	24, 30
10	.75		30	24, 28, 32
12	.75		28	24, 32
14	.75	\$1.00	24	20
16	.75	1.00	22	18, 20
18		1.00	20	18
20		1.00	20	16, 18

For general description of "*Little Giant*" Dies, see page 18.

Little Giant Adjustable Dies

Fractional Sizes

USS threads furnished unless otherwise specified.

Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

In ordering dies, specify outside diameter of collet.

Cutting Sizes	Diam. Collets Price Die, Each Size			No. Threads per Inch Standard Pitches			Also Furnished USF
	1 1/4"	1 5/8"	*2" 2 3/4" 4" 4 1/2"	USS	SAE	Whit.	
1/16	\$.75			64		60	72
5/64	.75			60		..	72
3/32	.75			50		48	48
7/64	.75			48		..	..
1/8	.75			40		40	32
9/64	.75			40		..	..
5/32	.75			36		32	32
11/64	.75			32		..	..
3/16	.75		\$1.00	24		24	32
13/64	.75		1.00	24		24	..
7/32	.75		1.00	24		24	32
15/64	.75		1.00	24		24	..
1/4	.75	\$1.00	1.00	20	28	20	24, 27, 32
5/16		1.00	1.00	18	24	18	20, 27, 32
3/8		1.25	1.25	16	24	16	20, 27
7/16			1.25	14	20	14	24, 27
1/2			1.50	13	20	12	12, 24, 27
9/16			1.50	12	18	12	27
5/8			1.75	11	18	11	12, 27
11/16			1.75	11	16	11	..
3/4			2.00	10	16	10	12, 27
13/16			2.75	10	..	10	..
7/8			2.75	9	14, 18	9	12, 27
15/16			2.75	9	..	9	..
1			2.75	8	14	8	12, 27
1 1/8			4.00	7	12	7	..
1 1/4			4.00	7	12	7	..
1 3/8			5.00	6	12	6	..
1 1/2			5.00	6	12	6	..

*NOTE. 2" Diam. collets take die sizes 3/16"-1/2" incl.

2 3/4" Diam. collets take die sizes 3/16"-1" incl.

4" Diam. collets take die sizes 5/8"-1 1/4" incl.

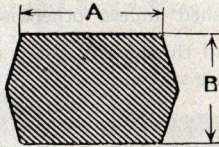
4 1/2" Diam. collets take die sizes 1 1/8"-1 1/2" incl.

Description of "Little Giant" Dies and Collets on page 18.



Little Giant Die Blanks

Cross Sectional Dimensions and Cutting Sizes
Regularly Accommodated in Each

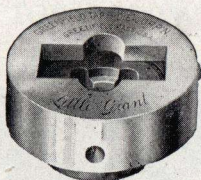


Blank No.	Die Size Inches		Cutting Sizes	Made to Fit	
	A	B		Collets	Stocks
A1	$\frac{23}{64}$	$\frac{1}{4}$	{ 2-16 inc. Mach. Screw $\frac{1}{16}$ - $\frac{9}{32}$ inc.	A1	
A10	$\frac{1}{2}$	$\frac{3}{8}$	{ 14-24 inc. Mach. Screw $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ Bolt	A10	
$\frac{1}{4}$ "	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$ Bolt, $\frac{1}{8}$ " Pipe	{ $\frac{1}{4}$ " No. 1 $\frac{1}{4}$ " No. 5 $\frac{1}{4}$ " Mach.	$\frac{1}{4}$ " Full Mounted $\frac{1}{8}$ ", No. 280 Pipe
$\frac{3}{8}$ "	$\frac{13}{32}$	$\frac{1}{2}$	$\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ " Bolt, $\frac{1}{4}$ " Pipe	{ $\frac{3}{8}$ " No. 1 $\frac{3}{8}$ " No. 5 $\frac{3}{8}$ " Mach.	$\frac{3}{8}$ " Full Mounted $\frac{1}{4}$ " No. 281 Pipe
$\frac{1}{2}$ " (No. 0) Pipe	$\frac{31}{32}$	$\frac{5}{8}$	$\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{11}{16}$, $\frac{3}{4}$ " Bolt $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ " Pipe	$\frac{1}{2}$ " No. 5 $\frac{1}{2}$ " No. 20 $\frac{1}{2}$ " Mach.	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ " Full Mounted $\frac{3}{8}$ " No. 282 Pipe $\frac{1}{2}$ " No. 283 Pipe No. 260 Pipe No. 200 "Trio"
$\frac{7}{8}$ "	$1\frac{1}{32}$	$\frac{13}{16}$	$\frac{11}{16}$, $\frac{7}{8}$, $\frac{15}{16}$, 1" Bolt	$\frac{7}{8}$ " No. 5 $\frac{7}{8}$ " No. 20 $\frac{7}{8}$ " No. 25 $\frac{7}{8}$ " Mach.	$\frac{7}{8}$ " Full Mounted
$1\frac{1}{8}$ "	$1\frac{1}{4}$	1	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ " Bolt	$1\frac{1}{8}$ " No. 20 $1\frac{1}{8}$ " No. 25 $1\frac{1}{8}$ " Mach.	$1\frac{1}{8}$ " Full Mounted
$1\frac{3}{8}$ "	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{8}$, $1\frac{3}{8}$, $1\frac{7}{16}$, $1\frac{1}{2}$ " Bolt	$1\frac{3}{8}$ " No. 25 $1\frac{3}{8}$ " Mach.	$1\frac{3}{8}$ " Full Mounted
No. 1 Pipe	$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1" Pipe	No. 1 Mach. Pipe	{ No. 261 Pipe $\frac{3}{4}$ " No. 284 Pipe 1" No. 285 Pipe No. 210 "Trio" No. 220 "Duo"
No. 1½ Pipe	$1\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$ " Pipe		261½ & 286 Pipe
No. 2 Pipe	$2\frac{1}{2}$	$\frac{7}{8}$	1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2" Pipe	No. 2 Mach. Pipe	Nos. 262, 288 Pipe
No. 3 Pipe	$3\frac{3}{16}$	$1\frac{1}{4}$	$2\frac{1}{2}$ and 3" Pipe	No. 3 Mach. Pipe	No. 263 Pipe

Little Giant Collets

Patented Feb. 23, 1915

(A Collet consists of a Cap and a Guide)



Standard Sizes

Collet No.	Outside Diameter. In.	Dimensions of Slot, Inches	Takes Dies Following Sizes
A1	1 1/4	23/64 x 3/4	All Sizes A1 Die
A10	1 5/8	1/2 x 1 1/8	All Sizes A10 Die
1/4 No. 1	2	1/2 x 1 3/8	3/16, 1/4, 5/16
3/8 No. 1	2	19/32 x 1 3/8	3/8, 7/16, 1/2
1/4 No. 5	2 3/4	1/2 x 1 3/8	3/16, 1/4, 5/16
3/8 No. 5	2 3/4	19/32 x 1 3/8	3/8, 7/16
1/2 No. 5	2 3/4	27/32 x 1 3/4	1/2, 9/16, 5/8, 11/16, 3/4
7/8 No. 5	2 3/4	*11/32 x 2 3/16	13/16, 7/8, 15/16, 1
1/2 No. 20	4	27/32 x 1 3/4	5/8, 11/16, 3/4
7/8 No. 20	4	*11/32 x 2 3/16	13/16, 7/8, 15/16, 1
1 1/8 No. 20	4	1 1/4 x 2 1/2	1 1/16, 1 1/8, 1 3/16, 1 1/4
7/8 No. 25	4 1/2	*11/32 x 2 3/16	13/16, 7/8, 15/16, 1
1 1/8 No. 25	4 1/2	1 1/4 x 2 1/2	1 1/16, 1 1/8, 1 3/16, 1 1/4
1 3/8 No. 25	4 1/2	1 1/2 x 3	1 5/16, 1 3/8, 1 7/16, 1 1/2

*Round Ends.

Prices

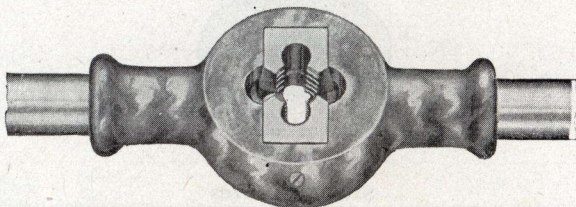
No. of Collet or Stock	Diam. of Collet Inches	Sizes of Dies	Price Each			Length of Stock Inches	Price of Stock
			Cap	Guide	Collet Com.		
A1	1 1/4	{ 0-16 } { 1/16-9/32 }	\$.35	\$.20	\$.55	7 1/2	\$1.25
A10	1 5/8	{ 14-24 } { 3/16-3/8 }	.50	.30	.80	13 1/2	2.00
1	2	3/16-1/2	.50	.30	.80	14 1/2	2.50
5	2 3/4	3/16-1	.80	.50	1.30	23	3.50
7	2 3/4	3/16-1	.80	.50	1.30	26	3.50
9	2 3/4	3/16-1	.80	.50	1.30	29	3.50
20	4	1/2-1 1/4	1.50	.75	2.25	40	6.00
25	4 1/2	1 3/16-1 1/2	2.00	1.00	3.00	52	8.00

Standard sizes and dimensions of collets shown above.

"Little Giant" Adjustable Dies fitting these collets listed on page 127.

Little Giant Full Mounted Stocks

Patented Feb. 23, 1915



The die slot in this stock is bevelled to fit "*Little Giant*" Dies the same as slots in "*Little Giant*" Collets described on page 129.

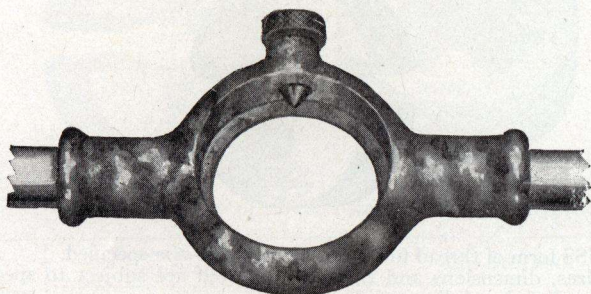
When ordered complete, each die is adjusted with its guide in a separate stock and is ready for use.

Size	Prices of Stocks and Parts				Stock, Die and Guide Complete
	Stock Only	Length of Stock, In.	Guide Only	Die Only	
$\frac{3}{16}$	\$1.60	$8\frac{3}{4}$	\$.30	\$1.00	\$2.90
$\frac{1}{4}$	1.60	$8\frac{3}{4}$	.30	1.00	2.90
$\frac{5}{16}$	1.60	$8\frac{3}{4}$	.30	1.00	2.90
$\frac{3}{8}$	1.90	$13\frac{1}{2}$	.30	1.25	3.45
$\frac{7}{16}$	1.90	$13\frac{1}{2}$	.30	1.25	3.45
$\frac{1}{2}$	2.25	$20\frac{1}{2}$	.50	1.50	4.25
$\frac{9}{16}$	2.25	$20\frac{1}{2}$	.50	1.50	4.25
$\frac{5}{8}$	2.75	$25\frac{1}{2}$	.50	1.75	5.00
$\frac{11}{16}$	2.75	$25\frac{1}{2}$	.50	1.75	5.00
$\frac{3}{4}$	2.75	$25\frac{1}{2}$	.50	2.00	5.25
$\frac{13}{16}$	3.25	29	.50	2.75	6.50
$\frac{7}{8}$	3.25	29	.50	2.75	6.50
$\frac{15}{16}$	3.25	29	.50	2.75	6.50
1	3.25	29	.50	2.75	6.50
$1\frac{1}{8}$	4.50	$39\frac{1}{2}$	.75	4.00	9.25
$1\frac{1}{4}$	4.50	$39\frac{1}{2}$	.75	4.00	9.25
$1\frac{3}{8}$	6.75	50	1.00	5.00	12.75
$1\frac{1}{2}$	6.75	50	1.00	5.00	12.75

Screw Plates containing these Stocks listed on page 28.

Little Giant

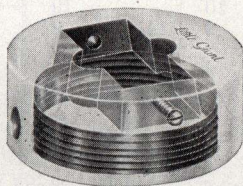
Stocks for Screw Plates



These stocks are used in all "*Little Giant*" Screw Plates except full mounted. In each of these assortments one stock accommodates all the collets regardless of the sizes of the dies, except in a very few cases where a wide range of cutting sizes necessitates the use of two stocks.

Stocks if so specified will be furnished with die and collet, making a complete equipment for cutting any one size.

For standard sizes and prices, see page 129.



Cap

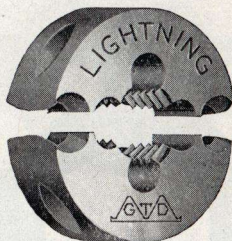


Guide

LIGHTNING Adjustable Die

No. 1950

Reversible for Screw Plate or Machine Use



USS form of thread furnished unless otherwise specified.

Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

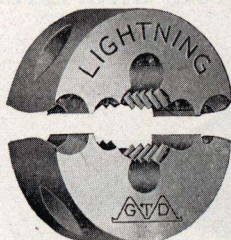
Cutting Sizes	Diameter Dies Inches Price of Each				No. of Threads to the Inch Standard Pitches			
	1 $\frac{1}{16}$	1 $\frac{1}{8}$	1 $\frac{3}{16}$	2 $\frac{1}{16}$	Standard Pitches		Whit- worth	USF
					USS	SAE		
$\frac{3}{16}$	\$1.00				24		24	32
$\frac{13}{64}$	1.00				24		24	
$\frac{7}{32}$	1.00				24		24	32
$\frac{15}{64}$	1.00				24		24	
$\frac{1}{4}$	1.00				20	28	20	24, 32
$\frac{5}{16}$	1.00				18	24	18	20, 32
$\frac{3}{8}$	1.15				16	24	16	20
$\frac{7}{16}$		\$1.30			14	20	14	24
$\frac{1}{2}$		1.50			13	20	12	12, 24
$\frac{9}{16}$			\$1.60		12	18	12	
$\frac{5}{8}$			1.75		11	18	11	12
$\frac{11}{16}$				\$1.90	11	16	11	
$\frac{3}{4}$				2.00	10	16	10	12
$\frac{13}{16}$				2.25	10		10	
$\frac{7}{8}$				2.50	9	14, 18	9	12
$\frac{15}{16}$				2.75	9		9	
1				3.00	8	14	8	12
	$\frac{27}{16}$	$\frac{211}{16}$	$\frac{215}{16}$					
$1\frac{1}{8}$	3.50				7	12	7	
$1\frac{1}{4}$		4.00			7	12	7	
$1\frac{3}{8}$			4.50		6	12	6	
$1\frac{1}{2}$			5.00		6	12	6	

Collets for above dies listed on following page.

For general description of "Lightning" Dies, see page 46.

LIGHTNING Dies and Collets

For Screw Plates



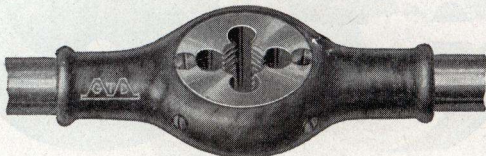
Pitches and forms of thread listed on preceding page.

Size	Collets without Dies Outside Diameter			Dies No. 1950		
	2 $\frac{3}{16}$ " No. 1955	2 $\frac{3}{4}$ " No. 1956	4 $\frac{1}{4}$ " No. 1957	Outside Diam.	Thickness	Price
3 $\frac{1}{16}$	\$1.50	\$1.50		1 $\frac{7}{16}$	1 $\frac{1}{2}$	\$1.00
1 $\frac{1}{4}$	1.50	1.50		1 $\frac{7}{16}$	1 $\frac{1}{2}$	1.00
5 $\frac{1}{16}$	1.50	1.50		1 $\frac{7}{16}$	1 $\frac{1}{2}$	1.00
3 $\frac{3}{8}$	1.50	1.50		1 $\frac{7}{16}$	1 $\frac{1}{2}$	1.15
7 $\frac{1}{16}$	1.50	1.50		1 $\frac{11}{16}$	9 $\frac{1}{16}$	1.30
1 $\frac{1}{2}$	1.50	1.50		1 $\frac{11}{16}$	9 $\frac{1}{16}$	1.50
9 $\frac{1}{16}$		1.50		1 $\frac{15}{16}$	5 $\frac{5}{8}$	1.60
5 $\frac{5}{8}$		1.50		1 $\frac{15}{16}$	5 $\frac{5}{8}$	1.75
1 $\frac{11}{16}$		1.50		2 $\frac{3}{16}$	1 $\frac{11}{16}$	1.90
3 $\frac{3}{4}$		1.50		2 $\frac{3}{16}$	1 $\frac{11}{16}$	2.00
1 $\frac{3}{8}$		1.50		2 $\frac{3}{16}$	7 $\frac{7}{8}$	2.25
7 $\frac{7}{8}$		1.50	\$4.00	2 $\frac{3}{16}$	7 $\frac{7}{8}$	2.50
1 $\frac{5}{16}$		1.50	4.00	2 $\frac{3}{16}$	1	2.75
1		1.50	4.00	2 $\frac{3}{16}$	1	3.00
1 $\frac{1}{8}$			4.00	2 $\frac{7}{16}$	1 $\frac{1}{8}$	3.50
1 $\frac{1}{4}$			4.00	2 $\frac{11}{16}$	1 $\frac{1}{4}$	4.00
1 $\frac{3}{8}$			4.00	2 $\frac{15}{16}$	1 $\frac{3}{8}$	4.50
1 $\frac{1}{2}$			4.00	2 $\frac{15}{16}$	1 $\frac{1}{2}$	5.00

2 $\frac{3}{16}$ " Diam. collets used in Screw Plates Nos. 8001, 8009, 8101, Metric Sets 8041, 8401.

2 $\frac{3}{4}$ " Diam. collets used in Screw Plates Nos. 8002, 8005, 8004, 8006, 8007, 8009, 8050, 8005 $\frac{1}{2}$, 8105, 8107, Metric Sets 8045, 8047, 8405, 8407.

4 $\frac{1}{4}$ " Diam. collets used in Screw Plates Nos. 8025, 8050.

LIGHTNING**Full Mounted Stocks and Dies**

Complete description of adjustment given on page 46.

Pitches and forms of thread for dies listed on page 132.

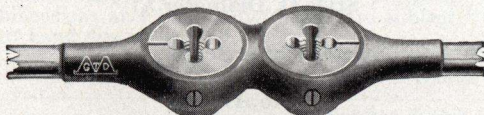
Size	Stock Only, No. 1951		Dies No. 1950		
	Price Each	Length Inches	Outside Diam. Inches	Thickness Inches	Price Each
$\frac{3}{16}$	\$2.00	$11\frac{1}{4}$	$1\frac{7}{16}$	$\frac{1}{2}$	\$1.00
$\frac{1}{4}$	2.00	$11\frac{1}{4}$	$1\frac{7}{16}$	$\frac{1}{2}$	1.00
$\frac{5}{16}$	2.00	$12\frac{3}{4}$	$1\frac{7}{16}$	$\frac{1}{2}$	1.00
$\frac{3}{8}$	2.25	15	$1\frac{7}{16}$	$\frac{1}{2}$	1.15
$\frac{7}{16}$	2.25	$16\frac{7}{8}$	$1\frac{11}{16}$	$\frac{9}{16}$	1.30
$\frac{1}{2}$	2.75	$18\frac{1}{4}$	$1\frac{11}{16}$	$\frac{9}{16}$	1.50
$\frac{9}{16}$	2.75	20	$1\frac{15}{16}$	$\frac{5}{8}$	1.60
$\frac{5}{8}$	3.25	20	$1\frac{15}{16}$	$\frac{5}{8}$	1.75
$1\frac{1}{16}$	3.25	$22\frac{1}{2}$	$2\frac{3}{16}$	$1\frac{1}{16}$	1.90
$\frac{3}{4}$	3.25	$22\frac{1}{2}$	$2\frac{3}{16}$	$1\frac{1}{16}$	2.00
$1\frac{3}{16}$	3.75	$25\frac{3}{4}$	$2\frac{3}{16}$	$\frac{7}{8}$	2.25
$\frac{7}{8}$	3.75	$25\frac{3}{4}$	$2\frac{3}{16}$	$\frac{7}{8}$	2.50
$1\frac{5}{16}$	3.75	$30\frac{3}{4}$	$2\frac{3}{16}$	1	2.75
1	3.75	$30\frac{3}{4}$	$2\frac{3}{16}$	1	3.00

This style of stock used in screw plates listed on page 49.

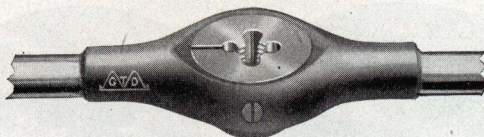
Elastic Stocks for Lightning Dies listed on page 138.

Pump Makers' Stocks and Dies

With "OK" Adjustable Dies



Double Die Stock, No. 920



Single Die Stock, Nos. 921, 922, 923

These stocks are used in pump installation and repair work, to thread the ends of pump rods ready for the couplings.

Furnished only in V form of thread, $\frac{1}{32}$ " oversize.

Each double stock is furnished with two "OK" adjustable dies, adjusted ready for use. The guide is a part of the stock.

Each single stock is furnished with one "OK" adjustable die, adjusted ready for use. The guide is a part of the stock.

Sizes and Prices

No.	Price Each	Cutting Sizes	Style	Length Inches	Weight Oz.
920	\$4.50	$\left\{ \begin{array}{l} \frac{3}{8} \frac{1}{32} 14 \\ \frac{7}{16} \frac{1}{32} 12 \end{array} \right\}$	Double	14 $\frac{1}{2}$	25
921	2.50	$\frac{3}{8} \frac{1}{32} 14$	Single	13 $\frac{1}{2}$	20
922	2.50	$\frac{7}{16} \frac{1}{32} 12$	Single	13 $\frac{1}{2}$	20
923	2.50	$\frac{1}{2} \frac{1}{32} 12$	Single	13 $\frac{1}{2}$	20

Repair Parts Stocks

No.	Price Each	Style
920	\$2.00	Special Double
921	1.25	No. 1 $\frac{1}{2}$ "OK" Full Mounted
922	1.25	No. 1 $\frac{1}{2}$ "OK" Full Mounted
923	1.25	No. 1 $\frac{1}{2}$ "OK" Full Mounted

"OK" Adjustable Dies

For Stocks Nos.	Price Each	Size	Diam.	Thickness
920-921	\$1.25	$\frac{3}{8} \frac{1}{32} 14$	1 $\frac{1}{2}$	$\frac{1}{2}$
920-922	1.25	$\frac{7}{16} \frac{1}{32} 12$	1 $\frac{1}{2}$	$\frac{1}{2}$
923	1.25	$\frac{1}{2} \frac{1}{32} 12$	1 $\frac{1}{2}$	$\frac{1}{2}$

When ordering dies separately, specify number of stock for which intended. Pump Rod Dies are furnished only in V thread $\frac{1}{32}$ " oversize.

Taps listed on page 85.



GREEN RIVER Adjustable Dies

Style O, Diameter $\frac{7}{8}$ "

Machine Screw

No. 1960



We recommend the adoption of the ASME standard.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Cutting Sizes	Price Die and Guide Complete	Number of Threads to the Inch	
		ASME Standard	Also Furnished
1	\$1.00	72	56, 64
2	1.00	64	56
3	1.00	56	48
4	1.00	48	32, 36, 40
5	1.00	44	36, 40
6	1.00	40	32, 36
7	1.00	36	30, 32
8	1.00	36	30, 32, 40
9	1.00	32	24, 30
10	1.00	30	24, 28, 32
12	1.00	28	24, 32
14	1.00	24	20
16	1.00	22	18, 20
18	1.00	20	18

For general description of "Green River" Dies, see page 38.

GREENRIVER Adjustable Dies

USS threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

Cut- ting Sizes	Diameter of Die Inches Price Each					Number of Threads per Inch			
	7/8 Diam.	1 1/2 Diam.	2 3/8 Diam.	2 3/4 Diam.	3 3/8 Diam.	Standard Pitches			USF
						US	SAE	Whit.	
1/16	\$1.00					64	Furnished in 2 3/16" diam. dies only	60	72
5/64	1.00					60		..	72
3/32	1.00					50		48	48
7/64	1.00					48		..	56
1/8	1.00	\$1.25				40		40	32
9/64	1.00	1.25				40		..	
5/32	1.00	1.25				36		32	32
11/64	1.00	1.25				32		..	
3/16	1.00	1.25	\$1.25	\$1.25		24		24	32
13/64	1.00	1.25	1.25	1.25		24		24	
7/32	1.00	1.25	1.25	1.25		24		24	32
15/64	1.00	1.25	1.25	1.25		24		24	
1/4	1.00	1.25	1.25	1.25		20	28	20	24, 32
5/16		1.25	1.25	1.25		18	24	18	20, 32
3/8		1.25	1.50	1.50		16	24	16	20
7/16		1.25	1.50	1.50		14	20	14	24
1/2		1.25	1.50	1.50		13	20	12	12, 24
9/16			1.60	1.60		12	18	12	
5/8			1.75	1.75		11	18	11	12
11/16			1.90	1.90		11	16	11	
3/4			2.00	2.00		10	16	10	12
13/16			2.25	2.25		10		10	
7/8			2.50	2.50	\$2.50	9	14, 18	9	12
15/16			2.75	2.75	2.75	9		9	
1			3.00	3.00	3.00	8	14	8	12
1 1/8				3.50	3.50	7	12	7	
1 1/4				4.00	4.00	7	12	7	
1 3/8					4.50	6	12	6	
1 1/2					5.00	6	12	6	
Guide	*	.70	1.00	1.00	1.50				

* 7/8" die furnished complete with guide. Not sold separately.

LIGHTNING**Elastic Stock for Screw Plates**

The "*Lightning*" Elastic Stock is furnished with all "*Lightning*" and "*Green River*" single stock screw plates.

These stocks are provided with an opening and closing device which firmly holds the collets when in use, yet prevents their sticking and greatly facilitates their removal when necessary to change dies.

It is never necessary to drive a die out of the "*Lightning*" Elastic Stock or force a die in.

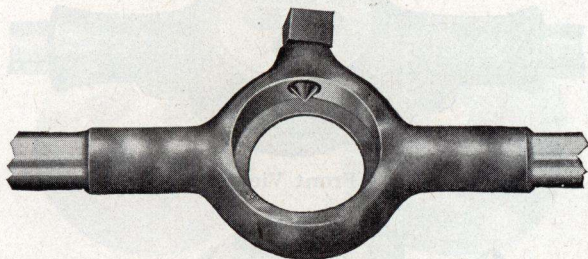
Adjustment is obtained by a screw with a right and left hand thread used in connection with a washer, which tightens or loosens the grip of the stock on the collet.

If a die has been adjusted "wide," the stock itself can be opened wider than normal by backing out the adjusting screw with the turning pin. This causes the washer to spread the opening.

This is often a great convenience and time saver, and is an exclusive feature with "*Lightning*" and "*Green River*" Screw Plates.

Stock No.	Price Each	For Die or Collet, Outside Diam. Inches	Length Inches	Stock No.	Price Each	For Die or Collet, Outside Diam. Inches	Length Inches
1800	\$1.25	$\frac{7}{8}$	6	1804	\$3.50	$2\frac{3}{4}$	23
1801 $\frac{1}{2}$	2.25	$1\frac{1}{2}$	15	1805	3.50	$2\frac{3}{4}$	29
1802	3.00	$2\frac{3}{16}$	21	1806	3.50	$2\frac{3}{4}$	40
1803	3.00	$2\frac{3}{16}$	22	1807	6.00	$3\frac{7}{16}$	50
1803 $\frac{1}{2}$	3.00	$2\frac{3}{16}$	29	1809	8.00	$4\frac{1}{4}$	53

Stocks for Adjustable Round Split Dies



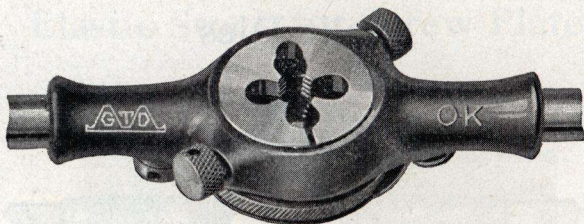
GTD Stocks for Adjustable Round or "*Button*" Dies are made from selected malleable iron castings accurately machined and highly polished, the center being given a finish which is both durable and pleasing. The handles, which are cast solid with the center in the small sizes, are made of hollow steel tubing in the large stocks. This construction makes the large stock fully as light and well balanced as some of the smaller solid stocks. The handles are knurled to insure a firm grip.

A set screw is threaded into the body so as to enter the spot in the side of the die and as the die fits the stock closely a very small pressure on the set screw secures it solidly.

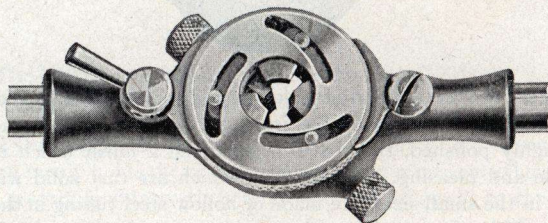
Dies for these stocks listed on pages 142 to 149 inclusive.

No.	Diam. of Dies Inches	Length Inches	Weight	Price
1850	$\frac{5}{8}$	5	1 oz.	\$.75
1851	$\frac{13}{16}$	$6\frac{1}{4}$	2 oz.	1.00
1852	1	9	5 oz.	1.25
1397	$1\frac{5}{16}$	12	1 lb.	1.75
1854	$1\frac{7}{16}$	14	$1\frac{1}{4}$ lb.	2.00
1853	$1\frac{1}{2}$	14	$1\frac{1}{4}$ lb.	2.00
1855	$1\frac{9}{16}$	16	$1\frac{1}{4}$ lb.	2.00
1856	$1\frac{3}{4}$	23	$1\frac{1}{2}$ lb.	2.50
1857	2	23	$1\frac{7}{8}$ lb.	2.50
1398	$2\frac{1}{4}$	26	2 lbs.	3.50
1858	$2\frac{1}{2}$	26	$2\frac{1}{2}$ lbs.	3.50
1859	3	32	$2\frac{7}{8}$ lbs.	6.00

"OK" Adjustable Guide Stocks



Front View



Reverse View

No Changing of Bushings

The adjustable guide jaws can easily be set to fit any size rod, by turning the cam plate.

Pressed Steel Construction

All adjustable guide parts made of steel. Stronger, lighter and more compact than castings. Locking lever holds cam in place.

One adjustable guide takes the place of from five to nine solid guides.

No.	Range of Sizes	Takes Dies Outside Diameter	Length	Price Each
"OK" 1	$\frac{3}{16}$ to $\frac{5}{8}$	$1\frac{1}{2}$ "	14"	\$3.00
"OK" 5	$\frac{1}{4}$ to $\frac{3}{4}$	2"	$23\frac{1}{2}$ "	3.50
"OK" 10	$\frac{1}{4}$ to 1"	2"	26"	4.00

Stocks with Guides for "OK" Full Mounted Screw Plates Separate Stock for Each Size Die.

No.	Holds Dies			Length	Price
C 1	1" diam. dies cutting	$\frac{1}{4}$ "	$\frac{5}{16}$ ", $\frac{3}{8}$ "	10"	\$1.00
D $1\frac{1}{2}$	$1\frac{1}{2}$ " " " "	$\frac{7}{16}$ "	$\frac{1}{2}$ "	16"	1.25
E 2	2" " " "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	23"	2.00
E 3	2" " " "	$\frac{7}{8}$ "	1"	26"	2.25

"OK" Adjustable Dies

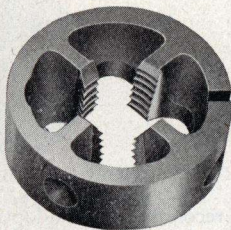
Patented Dec. 31, 1912

Furnished in Screw Plates, listed on pages 33-36.

No. 392



Front View



Back View

$1\frac{1}{2}$ " outside diameter, $\frac{1}{2}$ " thick

2" outside diameter, $\frac{5}{8}$ " and $\frac{3}{4}$ " *thick

USS threads furnished unless otherwise ordered.

Unless "OK" Dies are specifically ordered, our Adjustable Round Split Dies, Nos. 381 or 382, will be furnished.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

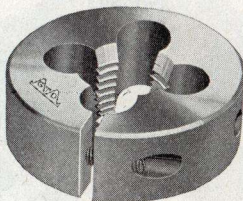
Cutting Size Inches	Outside Diameter Price Each		Standard Pitches		
	$1\frac{1}{2}$ "	2"	USS	SAE	Whit.
$\frac{1}{4}$	\$1.25	\$2.00	20	28	20
$\frac{5}{16}$	1.25	2.00	18	24	18
$\frac{3}{8}$	1.25	2.00	16	24	16
$\frac{7}{16}$	1.25	2.00	14	20	14
$\frac{1}{2}$	1.25	2.00	13	20	12
$\frac{9}{16}$		2.00	12	18	12
$\frac{5}{8}$		2.00	11	18	11
$\frac{11}{16}$		2.00	11	16	11
$\frac{3}{4}$		2.00	10	16	10
$\frac{13}{16}$		2.00	10		10
$\frac{7}{8}$		2.00	9	14, 18	9
$\frac{15}{16}$		2.25	9		9
1"		2.25	8	14	8

* $\frac{1}{4}$ to $\frac{11}{16}$ " incl.— $\frac{5}{8}$ " thick, $\frac{3}{4}$ to 1" incl.— $\frac{3}{4}$ " thick.

Adjustable Round Split Dies

No. 381

Machine Screw Sizes



We recommend the adoption of the ASME standard.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

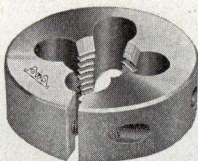
Sizes and Prices

Screw Gage No.	Outside Diameter—Price Each						No. of Threads to the Inch	
	Carbon Steel			High Speed Steel			ASME Standard	Also Furnished
	$\frac{5}{8}$ Inch $\frac{1}{4}$ " Thick	$\frac{11}{16}$ Inch $\frac{3}{8}$ " Thick	1 Inch $\frac{3}{8}$ " Thick	$\frac{5}{8}$ Inch $\frac{3}{4}$ " Thick	$\frac{11}{16}$ Inch $\frac{3}{2}$ " Thick	1 Inch $\frac{3}{8}$ " Thick		
0	\$.80	\$.90	..	\$1.00	\$1.20	....	80	..
1	.80	.90	..	1.00	1.20	....	72	56, 64
2	.70	.80	..	1.00	1.20	....	64	56
3	.60	.70	..	1.00	1.20	....	56	48
4	.50	.60	..	1.00	1.20	....	48	32,36,40
5	.50	.60	..	1.00	1.20	....	44	36, 40
6	.50	.60	\$.75	1.00	1.20	\$1.75	40	32, 36
7	.50	.60	.75	1.00	1.20	1.75	36	30, 32
8	.50	.60	.75	1.00	1.20	1.75	36	30,32,40
9	.50	.60	.75	1.00	1.20	1.75	32	24, 30
10	.50	.60	.75	1.00	1.20	1.75	30	24,28,32
12	.50	.60	.75	1.00	1.20	1.75	28	24, 32
14	.50	.60	.75	1.00	1.20	1.75	24	20
16	..	.60	.75	....	....	....	22	18, 20
18	..	.60	.75	....	....	....	20	18
20	..	.60	.75	....	....	....	20	16, 18

Adjustable Round Split Dies

No. 382

Fractional Sizes



$\frac{5}{8}$ Inch Outside Diameter, $\frac{1}{4}$ " Thick
 $\frac{13}{16}$ Inch Outside Diameter, $\frac{9}{32}$ " Thick
 1 Inch Outside Diameter, $\frac{3}{8}$ " Thick

USS threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Sizes and Prices

Cutting Size In.	Outside Diameter Price Each			Number of Threads to the Inch				Also Furnished
				Standard Pitches				
	$\frac{5}{8}$ Inch	$\frac{11}{16}$ Inch	1 Inch	USS	SAE	Whitworth	Brit. Std. Fine	USF
$\frac{1}{16}$	\$.80	\$.90	..	64	..	60	..	72
$\frac{5}{64}$	.70	.80	..	60	..	..	..	72
$\frac{3}{32}$	.60	.70	..	50	..	48	..	48
$\frac{7}{64}$	.50	.60	..	48	..	..	..	..
$\frac{1}{8}$	.50	.60	\$.75	40	..	40	..	32
$\frac{9}{64}$	.50	.60	.75	40	..	..	..	..
$\frac{5}{32}$	.50	.60	.75	36	..	32	..	32
$\frac{11}{64}$	.50	.60	.75	32	..	..	..	..
$\frac{3}{16}$	.50	.60	.75	24	..	24	..	32
$\frac{13}{64}$	.50	.60	.75	24	..	24	..	..
$\frac{7}{32}$	.50	.60	.75	24	..	24	..	32
$\frac{15}{64}$	.50	.60	.75	24	..	24	..	..
$\frac{1}{4}$	.50	.60	.75	20	28	20	26	24, 27, 32
$\frac{5}{16}$	..	.60	.75	18	24	18	22	20, 27, 32
$\frac{3}{8}$	..	..	.75	16	24	16	20	20, 27
$\frac{7}{16}$	..	..	.75	14	20	14	18	24, 27

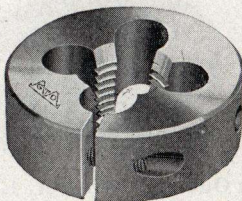
All tools catalogd are made to standard commercial tolerances.
 For specials, see page 115.



Adjustable Round Split Dies

No. 382

Fractional Sizes



$1\frac{5}{16}$ Inch Outside Diameter, $\frac{7}{16}$ " Thick

$1\frac{1}{2}$ Inch Outside Diameter, $\frac{1}{2}$ " Thick

$1\frac{9}{16}$ Inch Outside Diameter, $\frac{9}{16}$ " Thick

$1\frac{3}{4}$ Inch Outside Diameter, $\frac{9}{16}$ " Thick

USS threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Sizes and Prices

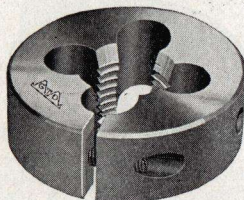
Cutting Size In.	Outside Diameter Price Each				Number of Threads to the Inch				
					Standard Pitches				Also Furnished
	$1\frac{1}{16}$ Inch	$1\frac{1}{2}$ Inch	$1\frac{1}{16}$ Inch	$1\frac{1}{4}$ Inch	USS	SAE Std.	Whit. Std.	British Std. Fine	USF
$\frac{1}{4}$	\$1.25	\$1.25	\$1.50	\$2.00	20	28	20	26	24, 27, 32
$\frac{5}{16}$	1.25	1.25	1.50	2.00	18	24	18	22	20, 27, 32
$\frac{3}{8}$	1.25	1.25	1.50	2.00	16	24	16	20	20, 27
$\frac{7}{16}$	1.25	1.25	1.50	2.00	14	20	14	18	24, 27
$\frac{1}{2}$	1.25	1.25	1.50	2.00	13	20	12	16	12, 24, 27
$\frac{9}{16}$	...	1.25	1.50	2.00	12	18	12	16	27
$\frac{5}{8}$	...	1.25	1.50	2.00	11	18	11	14	12, 27
$1\frac{1}{16}$	...	...	...	2.00	11	16	11	14	...
$\frac{3}{4}$	...	...	...	2.00	10	16	10	12	12, 27

All tools catalogd are made to standard commercial tolerances.
For specials, see page 115.

Adjustable Round Split Dies

No. 382

Fractional Sizes



- 2 Inch Outside Diameter, $\frac{5}{8}$ " Thick
- $2\frac{1}{4}$ Inch Outside Diameter, $\frac{3}{4}$ " Thick
- $2\frac{1}{2}$ Inch Outside Diameter, $\frac{3}{4}$ " Thick
- *3 Inch Outside Diameter, $\frac{7}{8}$, 1, $1\frac{1}{4}$ " Thick

USS threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

Sizes and Prices

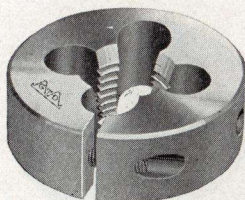
Cut- ting Size In.	Outside Diameter Price Each				Number of Threads to the Inch				
					Standard Pitches				Also Furnished
	2 Inch	2¼ Inch	2½ Inch	3 Inch	USS	SAE Std.	Whit Std.	British Std. Fine	USF
¼	\$2.00	\$3.00	...	...	20	28	20	26	24, 27, 32
5/16	2.00	3.00	...	...	18	24	18	22	20, 27, 32
3/8	2.00	3.00	...	...	16	24	16	20	20, 27
7/16	2.00	3.00	...	...	14	20	14	18	24, 27
1/2	2.00	3.00	\$3.00	...	13	20	12	16	12, 24, 27
9/16	2.00	3.00	3.00	...	12	18	12	16	27
5/8	2.00	3.00	3.00	...	11	18	11	14	12, 27
11/16	2.00	3.00	3.00	...	11	16	11	14	..
3/4	2.00	3.00	3.00	...	10	16	10	12	12, 27
13/16	2.00	3.00	3.00	...	10	..	10	12	..
7/8	2.00	3.00	3.00	\$5.00	9	14, 18	9	11	12, 27
15/16	...	3.00	3.00	5.00	9	..	9	..	..
1	...	3.00	3.00	5.00	8	14	8	10	12, 27
1 1/8	...	...	...	5.00	7	12	7	9	..
1 1/4	...	...	...	5.00	7	12	7	9	..
1 3/8	...	...	...	5.00	6	12	6	8	..
1 1/2	...	...	...	5.00	6	12	6	8	..

* $\frac{7}{8}$ ", $\frac{15}{16}$ ", 1"— $\frac{7}{8}$ " thick; $1\frac{1}{8}$ ", $1\frac{1}{4}$ "—1" thick; $1\frac{3}{8}$ ", $1\frac{1}{2}$ "— $1\frac{1}{4}$ " thick.

High Speed Steel

ADJUSTABLE ROUND SPLIT DIES

Fractional Sizes



$\frac{5}{8}$ Inch Outside Diameter $1\frac{1}{2}$ Inch Outside Diameter
 $\frac{13}{16}$ Inch Outside Diameter 2 Inch Outside Diameter
 1 Inch Outside Diameter $2\frac{1}{2}$ Inch Outside Diameter
 3 Inch Outside Diameter

USS form of thread furnished unless otherwise specified.
 Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

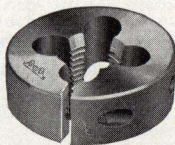
Sizes and Prices

Cutting Size Inches	Number of Threads to the Inch		Outside Diameter—Price Each						
	USS	SAE Std.	$\frac{5}{8}$ "	$\frac{13}{16}$ "	1"	$1\frac{1}{2}$ "	2"	$2\frac{1}{2}$ "	3"
$\frac{1}{8}$	40	..	\$1.00	\$1.20	\$1.75	...	...	...	...
$\frac{5}{32}$	36	..	1.00	1.20	1.75	...	...	...	...
$\frac{3}{16}$	24, 32	..	1.00	1.20	1.75	...	...	...	...
$\frac{7}{32}$	24	..	1.00	1.20	1.75	...	...	...	...
$\frac{1}{4}$	20	28	1.00	1.20	1.75	\$3.50	\$5.50	...	...
$\frac{5}{16}$	18	24	...	1.20	1.75	3.50	5.50	...	...
$\frac{3}{8}$	16	24	...	...	1.75	3.50	5.50	...	...
$\frac{7}{16}$	14	20	...	...	1.75	3.50	5.50	...	...
$\frac{1}{2}$	13	20	...	...	...	3.50	5.50	\$9.00	...
$\frac{9}{16}$	12	18	...	...	...	3.50	5.50	9.00	...
$\frac{5}{8}$	11	18	...	...	...	3.50	5.50	9.00	...
$1\frac{1}{16}$	11	16	...	...	...	...	5.50	9.00	...
$\frac{3}{4}$	10	16	...	...	...	...	5.50	9.00	...
$1\frac{3}{16}$	10	..	...	...	...	...	5.50	9.00	...
$\frac{7}{8}$	9	14, 18	...	...	...	...	5.50	9.00	\$16.00
$1\frac{5}{16}$	9	..	...	...	...	...	...	9.00	16.00
1	8	14	...	...	...	...	...	9.00	16.00
$1\frac{1}{8}$	7	12	...	...	...	...	...	...	16.00
$1\frac{1}{4}$	7	12	...	...	...	...	...	...	16.00
$1\frac{3}{8}$	6	12	...	...	...	...	...	...	16.00
$1\frac{1}{2}$	6	12	...	...	...	...	...	...	16.00

All tools catalogd are made to standard commercial tolerances.
 For specials, see page 115.

Adjustable Round Split Dies

Pipe Sizes



These dies are regularly furnished in Briggs Standard right hand thread.

The diameter of the thread at the small end is such that the Briggs Standard Plug Gage will screw flush with the face of the die.

Sizes, dimensions and threads not listed are subject to special prices.

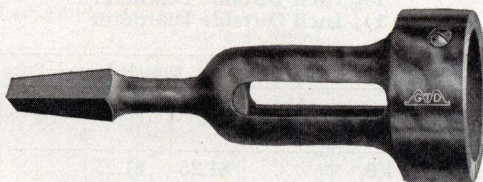
Left hand dies are special.

Sizes and Prices

Cutting Sizes Pipe Inches	No. of Threads to the Inch	Outside Diameter—Price Each						
		1 Inch	1 ⁵ / ₁₆ Inch	1 ¹ / ₂ Inch	1 ³ / ₄ Inch	2 Inch	2 ¹ / ₄ Inch	2 ¹ / ₂ Inch
⁵ / ₈	27	\$.75	\$1.25	\$1.25	\$1.50	\$2.00	\$3.00	\$3.00
¹ / ₄	18	...	1.25	1.25	1.50	2.00	3.00	3.00
³ / ₈	18	...	1.50	1.50	1.50	2.00	3.00	3.00
¹ / ₂	14	...	...	...	1.75	2.00	3.00	3.00
³ / ₄	14	...	...	...	...	...	3.25	3.25
1	11 ¹ / ₂	...	...	...	...	...	3.50	3.50

Holders for Round Adjustable Dies

Bit Brace and Round Shank



Specify style of shank and diameter if round shank is desired.

Diam. Die Inches	For Bit Brace		For Lathe			
	No.	Price	No.	Diam. Shank Inches	Total Length Inches	Price
⁵ / ₈	278	.75	279	¹ / ₂	4 ¹ / ₄	\$.75
¹³ / ₁₆	1861	1.00	1871	¹ / ₂ , ⁹ / ₁₆ , ¹¹ / ₁₆	4 ¹ / ₄	1.00
1	1862	1.50	1872	¹ / ₂ , ⁹ / ₁₆ , ¹¹ / ₁₆	4 ¹ / ₄	1.50
¹⁹ / ₁₆	1863	2.75	1873	³ / ₄ , ¹³ / ₁₆ , 1	6 ¹ / ₄	2.75



Adjustable Round Split Dies

French and International Standard

$1\frac{3}{16}$ Inch Outside Diameter

1 Inch Outside Diameter

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Cutting Size mm.	Standard Pitches mm.		Outside Diam.—Price Each	
	French	Inter-national	$1\frac{3}{16}$ Inch	1 Inch
2	..	.45	\$.80	..
2.5	..	.45	.70	..
3	.50	.60	.60	..
3.5	..	.60	.60	\$.75
4	.75	.75	.60	.75
4.5	..	.75	.60	.75
5	.75	.90	.60	.75
5.5	..	.90	.60	.75
6	1.0	1.0	.60	.75
7	1.0	1.0	.60	.75
8	1.0	1.25	.60	.75
9	1.0	1.25	..	.75
10	1.5	1.5	..	.75
11	..	1.5	..	.75

$1\frac{5}{16}$ Inch Outside Diameter

$1\frac{1}{2}$ Inch Outside Diameter

$1\frac{9}{16}$ Inch Outside Diameter

$1\frac{3}{4}$ Inch Outside Diameter

Cutting Size mm.	Std. Pitches mm.			Outside Diam.—Price Each			
	French	Inter-national	Also Fur-nished	$1\frac{3}{16}$ "	$1\frac{1}{2}$ "	$1\frac{9}{16}$ "	$1\frac{3}{4}$ "
6	1.0	1.0	...	\$1.25	\$1.25	...	...
7	1.0	1.0	...	1.25	1.25	...	...
8	1.0	1.25	...	1.25	1.25	...	...
9	1.0	1.25	...	1.25	1.25	\$1.50	\$2.00
10	1.5	1.5	...	1.25	1.25	1.50	2.00
11	...	1.5	...	1.25	1.25	1.50	2.00
12	1.5	1.75	...	1.25	1.25	1.50	2.00
14	2.0	2.0	...	...	1.25	1.50	2.00
16	2.0	2.0	...	...	1.25	1.50	2.00
18	2.5	2.5	1.5	...	...	...	2.00
20	2.5	2.5	...	...	...	...	2.00

Adjustable Round Split Dies

French and International Standard

- 2 Inch Outside Diameter
 2¼ Inch Outside Diameter
 2½ Inch Outside Diameter
 3 Inch Outside Diameter

Sizes, dimensions and threads not listed on this page are subject to special prices. Left hand dies are special.

Cutting Size mm.	Std. Pitches mm.			Outside Diam.—Price Each			
	French	Inter- national	Also Fur- nished	2"	2¼"	2½"	3"
12	1.5	1.75	...	\$2.00	\$3.00	\$3.00	...
14	2.0	2.0	...	2.00	3.00	3.00	...
16	2.0	2.0	...	2.00	3.00	3.00	...
18	2.5	2.5	1.5	2.00	3.00	3.00	...
20	2.5	2.5	...	2.00	3.00	3.00	...
22	2.5	2.5	...	2.00	3.00	3.00	\$5.00
24	3.0	3.0	...	...	3.00	3.00	5.00
26	3.0	...	...	...	3.00	3.00	5.00
27	...	3.0	...	...	...	...	5.00
28	3.0	...	...	...	...	...	5.00
30	3.5	3.5	...	...	...	...	5.00
32	3.5	...	...	...	...	...	5.00
33	...	3.5	...	...	...	...	5.00
34	3.5	...	...	...	...	...	5.00
36	4.0	4.0	...	...	...	...	5.00
38	4.0	...	...	...	...	...	5.00

Adjustable Round Split Dies

British Association Standard

Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

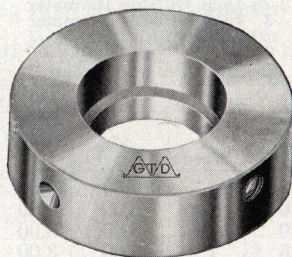
Sizes and Prices

Number	Diameter mm.	Pitch mm.	Outside Diameter— Price Each 1½ Inch
0	6.0	1.00	\$.60
1	5.3	.90	.60
2	4.7	.81	.60
3	4.1	.73	.60
4	3.6	.66	.60
5	3.2	.59	.60
6	2.8	.53	.60
7	2.5	.48	.60
8	2.2	.43	.60
9	1.9	.39	.60
10	1.7	.35	.60
12	1.3	.28	.80
14	1.0	.23	1.10



Bushings for Adjustable Round Split Dies

No. 367



These bushings are for adapting Adjustable Round Split Dies to holders of larger diameters.

Bushings Outside Diam.	Price Each	For Dies Outside Diam.	Bushings Outside Diam.	Price Each	For Dies Outside Diam.
1	\$.50	$\frac{5}{8}$	$2\frac{1}{4}$	\$2.00	1
1	.50	$1\frac{3}{16}$	$2\frac{1}{4}$	2.00	$1\frac{5}{16}$
$1\frac{5}{16}$	1.00	$1\frac{3}{16}$	$2\frac{1}{2}$	2.00	1
$1\frac{1}{2}$	1.00	1	$2\frac{1}{2}$	2.00	$1\frac{5}{16}$
2	1 00	1	3	2.00	2

Dies fitting these holders and bushings listed on pages 142-149.

Spring Screw Threading Dies

ASME STANDARD

These Dies are adjustable by means of a Clamp Collar. This Clamp Collar is not furnished with the dies unless so ordered.

Sizes, dimensions and threads not listed are subject to special prices.

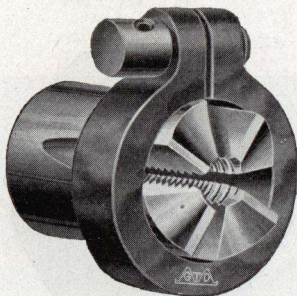
Left hand dies are special.

Sizes and Prices

Screw Gage No.	Outside Diam. Inches	Length Overall Inches	Price Each		Price of Clamp Collar	No. of Threads per Inch	
			Carbon Steel	High Speed Steel		Stand- ard	Also Furnished
2	$\frac{1}{2}$	$1\frac{1}{4}$	\$1.80	\$3.30	\$.50	64	56
3	$\frac{1}{2}$	$1\frac{1}{4}$	1.80	3.30	.50	56	48
4	$\frac{1}{2}$	$1\frac{1}{4}$	1.65	3.00	.50	48	32, 36, 40
5	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	2.75	.50	44	36, 40
6	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	2.75	.50	40	32, 36
8	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	2.75	.50	36	30, 32, 40
8	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	3.75	.60	36	30, 32, 40
10	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	3.75	.60	30	24, 28, 32
12	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	3.75	.60	28	24, 32
14	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	3.75	.60	24	20

Spring Screw Threading Dies

Fractional Sizes



These dies are adjustable by means of a clamp collar. This clamp collar is not furnished with the dies unless so ordered.

USS form of thread furnished unless otherwise specified.

High Speed steel spring screw threading dies will be regularly furnished in USS and SAE Standard only. All other high speed steel spring screw threading dies are special and subject to special prices.

Sizes, lengths and threads not listed are subject to special prices.

Left hand dies are special.

Sizes and Prices

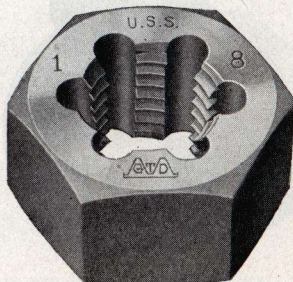
Cutting Size In.	Outside Diam. In.	Length Overall Inches	Price Each		Price of Clamp Collar	No. of Threads to the In.		
			Carbon Steel	High Speed Steel		USS	SAE Std.	Whit. Std.
1/8	1/2	1 1/4	\$1.50	\$2.75	\$0.50	40	..	40
3/16	1/2	1 1/4	1.50	2.75	.50	24	..	24
1/4	3/4	1 3/4	1.75	3.75	.60	20	28	20
5/16	3/4	1 3/4	1.75	3.75	.60	18	24	18
3/8	3/4	1 3/4	1.75	3.75	.60	16	24	16
7/16	1	2	2.00	4.85	.70	18	24	18
1/2	1	2	2.00	4.85	.70	16	24	16
5/8	1	2	2.00	4.85	.70	14	20	14
3/4	1 1/4	2 1/2	2.00	6.50	.80	16	24	16
7/8	1 1/4	2 1/2	2.00	6.50	.80	14	20	14
1	1 1/4	2 1/2	2.00	6.50	.80	13	20	12
1 1/8	1 1/4	2 1/2	2.00	6.50	.80	12	18	12
1 1/4	1 1/4	2 1/2	2.00	6.50	.80	11	18	11
1 1/2	1 3/8	2 1/2	2.40	8.00	1.00	13	20	12
1 3/4	1 3/8	2 1/2	2.40	8.00	1.00	12	18	12
1 7/8	1 3/8	2 1/2	2.40	8.00	1.00	11	18	11
2	1 3/8	2 1/2	2.40	8.00	1.00	11	16	11
2 1/8	1 3/8	2 1/2	2.40	8.00	1.00	10	16	10
2 1/4	1 3/8	2 1/2	2.75	9.75	1.00	11	18	11
2 3/8	1 3/8	2 1/2	2.75	9.75	1.00	10	16	10
2 1/2	1 3/8	2 1/2	2.75	9.75	1.00	9	14, 18	9
2 3/4	2	3	3.50	**	1.25	10	16	10
2 7/8	2	3	3.50	**	1.25	9	14, 18	9
3	2	3	3.50	**	1.25	8	14	8
1 1/8	2 1/2	3 1/2	6.00	**	2.00	8	14	8
1 1/4	2 1/2	3 1/2	6.00	**	2.00	7	12	7
1 1/2	2 1/2	3 1/2	6.00	**	2.00	7	12	7
1 3/4	2 1/2	3 1/2	6.00	**	2.00	6	12	6
1 7/8	2 1/2	3 1/2	6.00	**	2.00	6	12	6
2	2 1/2	3 1/2	6.00	**	2.00	6	12	6

**Prices on application.



Solid Hexagon Re-Threading Dies

No. 377



These dies are used only for repair work, for dressing over bruised or rusty threads.

They can be used in bit-brace sockets, ratchet or monkey-wrenches, and will be found convenient in many ways.

They are accurate, durable and will give satisfactory service.

USS threads furnished unless otherwise ordered.

Size	Price Each	Threads per Inch				Size of Die	
		USS	SAE Std.	Whit. Std.	BSF	Across Flats	Thickness
$\frac{1}{4}$	\$.70	20	28	20	26	$\frac{19}{32}$	$\frac{1}{4}$
$\frac{5}{16}$	.80	18	24	18	22	$\frac{11}{16}$	$\frac{5}{16}$
$\frac{3}{8}$	.90	16	24	16	20	$\frac{25}{32}$	$\frac{3}{8}$
$\frac{7}{16}$	1.00	14	20	14	18	$\frac{7}{8}$	$\frac{7}{16}$
$\frac{1}{2}$	1.10	13	20	12	16	$\frac{11}{16}$	$\frac{1}{2}$
$\frac{9}{16}$	1.20	12	18	12	16	$\frac{11}{16}$	$\frac{1}{2}$
$\frac{5}{8}$	1.40	11	18	11	14	$\frac{11}{16}$	$\frac{5}{8}$
$\frac{11}{16}$	1.60	11	16	11	14	$\frac{17}{16}$	$\frac{3}{4}$
$\frac{3}{4}$	1.80	10	16	10	12	$\frac{17}{16}$	$\frac{3}{4}$
$\frac{7}{8}$	2.10	9	14, 18	9	11	$\frac{15}{8}$	$\frac{7}{8}$
1	2.40	8	14	8	10	$\frac{113}{16}$	1
$1\frac{1}{8}$	2.80	7	12	7	9	2	1
$1\frac{1}{4}$	3.20	7	12	7	9	$2\frac{3}{16}$	1
$1\frac{3}{8}$	3.60	6	12	6	8	$2\frac{3}{8}$	1
$1\frac{1}{2}$	4.00	6	12	6	8	$2\frac{9}{16}$	1

Hexagon Re-Threading Dies

IN SETS



No.	470	471	472		473	
	USS	USS	USS	SAE	USS	SAE
Cutting Sizes	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
		$\frac{9}{16}$			$\frac{9}{16}$	$\frac{9}{16}$
		$\frac{5}{8}$			$\frac{5}{8}$	$\frac{5}{8}$
		$\frac{3}{4}$			$\frac{3}{4}$	$\frac{3}{4}$
		$\frac{7}{8}$				
		1				
Net Weight lbs.	1	3	1		3	
Prices	4.50	13.40	9.00		17.80	

Nos. 470 and 471 regularly furnished with USS threads, SAE or Whitworth substituted at same price if specified.

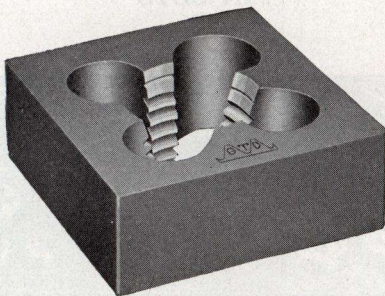
Nos. 472 and 473 regularly furnished with combination USS and SAE.

Whitworth or BSF substituted at same price if specified.



Solid Square Bolt Dies

No. 275



USS threads will be furnished unless otherwise specified. Whitworth threads also furnished at regular prices.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Sizes and Prices

Cutting Size Inches	Price Each	No. of Threads to the Inch		Size of Square Inches	Thickness Inches
		USS	Whit.		
$\frac{1}{4}$	\$1.80	20	20	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{5}{16}$	1.80	18	18	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{3}{8}$	1.80	16	16	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{7}{16}$	1.80	14	14	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{1}{2}$	1.80	13	12	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{9}{16}$	1.90	12	12	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{5}{8}$	2.00	11	11	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{11}{16}$	2.10	11	11	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{3}{4}$	2.20	10	10	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{13}{16}$	2.30	10	10	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{7}{8}$	2.40	9	9	$2\frac{1}{2}$	$\frac{3}{4}$
$\frac{15}{16}$	2.55	9	9	$2\frac{1}{2}$	$\frac{3}{4}$
1	2.70	8	8	$2\frac{1}{2}$	1
$1\frac{1}{8}$	3.00	7	7	$2\frac{1}{2}$	1
$1\frac{1}{4}$	3.30	7	7	$2\frac{1}{2}$	1
$1\frac{3}{8}$	3.60	6	6	$2\frac{1}{2}$	1
$1\frac{1}{2}$	3.90	6	6	3	1
$1\frac{5}{8}$	4.20	$5\frac{1}{2}$	5	3	1
$1\frac{3}{4}$	5.40	5	5	3	$1\frac{1}{4}$
$1\frac{7}{8}$	6.50	5	$4\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$
2	7.50	$4\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{3}{4}$	2

REAMER SECTION

Hand and Machine Reamers Countersinks

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GTD Adjustable Reamer

Patented January 3, 1917

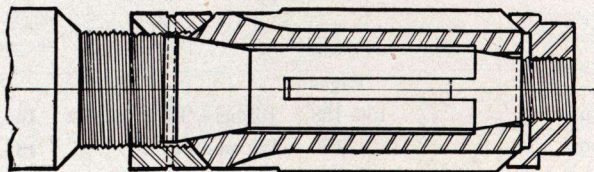
No. 490

Wide Adjustment

The new **GTD** Adjustable Reamer provides for a wide range of adjustment without distortion of the cutting lands and by a quick and easy method. It can be adjusted to split-thousandths for a range of minus 10-thousandths to plus 32-thousandths under and over the nominal cutting size.

All Lands Adjusted Simultaneously

In changing the adjustment all lands are released at one time by turning the locknut — it is not necessary to unlock each land separately. It is then but a moment's work to correct the adjustment by turning the fine threaded adjusting nut to the desired position. This nut has micrometer graduations making the adjustment both quick and positive.



Lands Positively Supported

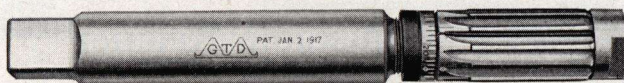
The cut shows how the cutting lands are supported on conical shoulders at either end. They are prevented from twisting out of alignment or slipping around the body by splines fitting snugly along the center. The locknut and micrometer adjusting nut are made cup-shaped to receive the chamfered ends of the lands.

Exceptionally Long Life

The lands are made of a special alloy carbon or high speed steel and may be used indefinitely as the adjustment compensates for any reduction in size due to sharpening.

All wearing parts are carefully hardened and ground.

GTD Adjustable Reamer



No 490

Adjustment of these reamers ranges from — .010 to + .030 for each size listed.

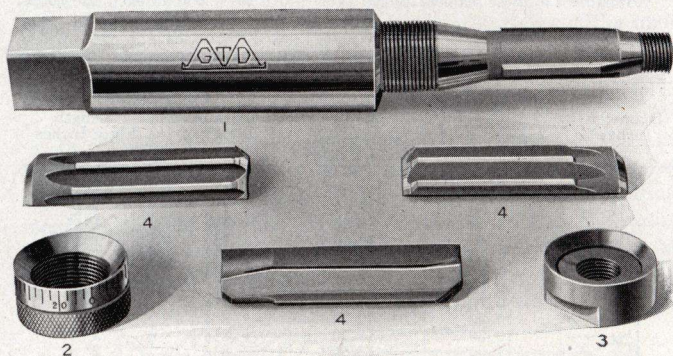
Sizes and Prices

Diameter Inches	Price Each		Length over all Inches	Length Flute Inches
	With Carbon Steel Blades	With High Speed Steel Blades		
$\frac{3}{4}$	\$8.00	\$10.00	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{25}{32}$	8.00	10.00	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{13}{16}$	8.50	10.60	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{27}{32}$	8.50	10.60	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{7}{8}$	9.10	11.30	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{29}{32}$	9.10	11.30	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{15}{16}$	9.70	12.00	$7\frac{1}{2}$	$1\frac{5}{8}$ "
$\frac{31}{32}$	9.70	12.00	$7\frac{1}{2}$	$1\frac{5}{8}$ "
1	10.30	12.70	$8\frac{1}{2}$	2"
$1\frac{1}{32}$	10.30	12.70	$8\frac{1}{2}$	2"
$1\frac{1}{16}$	11.00	13.50	$8\frac{1}{2}$	2"
$1\frac{3}{32}$	11.00	13.50	$8\frac{1}{2}$	2"
$1\frac{1}{8}$	11.70	14.30	$8\frac{1}{2}$	2"
$1\frac{5}{32}$	11.70	14.30	$8\frac{1}{2}$	2"
$1\frac{3}{16}$	12.40	15.10	$8\frac{1}{2}$	2"
$1\frac{7}{32}$	12.40	15.10	$8\frac{1}{2}$	2"
$1\frac{1}{4}$	13.10	15.90	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{9}{32}$	13.10	15.90	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{5}{16}$	13.90	16.80	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{11}{32}$	13.90	16.80	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{3}{8}$	14.70	17.70	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{13}{32}$	14.70	17.70	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{7}{16}$	15.50	18.60	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{15}{32}$	15.50	18.60	$9\frac{1}{2}$	$2\frac{1}{4}$ "
$1\frac{1}{2}$	16.30	19.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{17}{32}$	16.30	19.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{9}{16}$	17.20	20.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{19}{32}$	17.20	20.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{5}{8}$	18.10	21.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{21}{32}$	18.10	21.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{11}{16}$	19.00	22.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{23}{32}$	19.00	22.50	$10\frac{1}{2}$	$2\frac{3}{8}$ "
$1\frac{3}{4}$	20.00	23.60	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{25}{32}$	20.00	23.60	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{13}{16}$	21.00	24.70	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{27}{32}$	21.00	24.70	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{7}{8}$	22.00	25.80	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{29}{32}$	22.00	25.80	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{15}{16}$	23.10	27.00	$11\frac{1}{2}$	$2\frac{5}{8}$ "
$1\frac{31}{32}$	23.10	27.00	$11\frac{1}{2}$	$2\frac{5}{8}$ "
2	24.20	28.20	$11\frac{1}{2}$	$2\frac{5}{8}$ "

For smaller adjustable reamers, see page 162.

Repair Parts for GTD Adjustable Reamer

No. 490



Repair Parts for No. 490 Reamer

Cutting Sizes Inches Inclusive	Body No. 1	Back Adjusting Nut No. 2	Front Adjusting Nut No. 3	Carbon Steel Lands Per Set No. 4	High Speed Steel Lands Per Set No. 4
$\frac{3}{4}$ to $1\frac{1}{32}$	\$3.70	\$1.80	\$1.20	\$3.00	\$5.30
1" to $1\frac{7}{32}$	5.00	2.00	1.40	4.00	6.70
$1\frac{1}{4}$ to $1\frac{15}{32}$	6.40	2.30	1.70	5.10	8.20
$1\frac{1}{2}$ to $1\frac{23}{32}$	7.90	2.70	2.00	6.40	9.90
$1\frac{3}{4}$ to 2"	10.70	3.20	2.30	8.00	12.00



Hand Reamers

No. 400



Sets of these reamers listed on page 161.

Hand Reamers with threaded ends and all sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diameter Inches	Price Each		Length overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{1}{8}$	\$1.00	\$3.00	3	$1\frac{1}{2}$
$\frac{9}{64}$	1.10	3.25	$3\frac{1}{4}$	$1\frac{5}{8}$
$\frac{5}{32}$	1.10	3.25	$3\frac{1}{4}$	$1\frac{5}{8}$
$\frac{11}{64}$	1.20	3.25	$3\frac{1}{2}$	$1\frac{3}{4}$
$\frac{3}{16}$	1.20	3.25	$3\frac{1}{2}$	$1\frac{3}{4}$
$\frac{13}{64}$	1.30	3.50	$3\frac{3}{4}$	$1\frac{7}{8}$
$\frac{7}{32}$	1.30	3.50	$3\frac{3}{4}$	$1\frac{7}{8}$
$\frac{15}{64}$	1.40	3.50	4	2
$\frac{1}{4}$	1.40	3.50	4	2
$\frac{17}{64}$	1.45	3.75	$4\frac{1}{4}$	$2\frac{1}{8}$
$\frac{9}{32}$	1.45	3.75	$4\frac{1}{4}$	$2\frac{1}{8}$
$\frac{19}{64}$	1.50	3.75	$4\frac{1}{2}$	$2\frac{1}{4}$
$\frac{5}{16}$	1.50	3.75	$4\frac{1}{2}$	$2\frac{1}{4}$
$\frac{21}{64}$	1.55	4.25	$4\frac{3}{4}$	$2\frac{3}{8}$
$\frac{11}{32}$	1.55	4.25	$4\frac{3}{4}$	$2\frac{3}{8}$
$\frac{23}{64}$	1.60	4.25	5	$2\frac{1}{2}$
$\frac{3}{8}$	1.60	4.25	5	$2\frac{1}{2}$
$\frac{25}{64}$	1.70	4.75	$5\frac{1}{4}$	$2\frac{5}{8}$
$\frac{13}{32}$	1.70	4.75	$5\frac{1}{4}$	$2\frac{5}{8}$
$\frac{27}{64}$	1.75	4.75	$5\frac{1}{2}$	$2\frac{3}{4}$
$\frac{7}{16}$	1.75	4.75	$5\frac{1}{2}$	$2\frac{3}{4}$
$\frac{29}{64}$	1.85	5.25	$5\frac{3}{4}$	$2\frac{7}{8}$
$\frac{15}{32}$	1.85	5.25	$5\frac{3}{4}$	$2\frac{7}{8}$
$\frac{31}{64}$	1.90	5.25	6	3
$\frac{1}{2}$	1.90	5.25	6	3
$\frac{33}{64}$	1.95	5.75	$6\frac{1}{4}$	$3\frac{1}{8}$
$\frac{17}{32}$	1.95	5.75	$6\frac{1}{4}$	$3\frac{1}{8}$
$\frac{35}{64}$	2.00	5.75	$6\frac{1}{2}$	$3\frac{1}{4}$
$\frac{9}{16}$	2.00	5.75	$6\frac{1}{2}$	$3\frac{1}{4}$
$\frac{37}{64}$	2.10	6.25	$6\frac{3}{4}$	$3\frac{3}{8}$
$\frac{19}{32}$	2.10	6.25	$6\frac{3}{4}$	$3\frac{3}{8}$
$\frac{39}{64}$	2.20	6.25	7	$3\frac{1}{2}$
$\frac{5}{8}$	2.20	6.25	7	$3\frac{1}{2}$
$\frac{41}{64}$	2.30	6.75	$7\frac{11}{32}$	$3\frac{43}{64}$
$\frac{21}{32}$	2.30	6.75	$7\frac{11}{32}$	$3\frac{43}{64}$
$\frac{43}{64}$	2.40	6.75	$7\frac{11}{16}$	$3\frac{27}{32}$
$\frac{11}{16}$	2.40	6.75	$7\frac{11}{16}$	$3\frac{27}{32}$
$\frac{45}{64}$	2.50	7.25	$8\frac{1}{8}$	$4\frac{1}{16}$

Continued on following page

All tools catalogd are made to standard commercial tolerances.

For special reamers, see page 248.



Hand Reamers

No. 400

(Continued)

Sizes and Prices

Diameter Inches	Price Each		Length overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$2\frac{3}{32}$	\$2.50	\$7.25	$8\frac{1}{8}$	$4\frac{1}{16}$
$4\frac{7}{64}$	2.60	7.25	$8\frac{3}{8}$	$4\frac{3}{16}$
$3\frac{3}{4}$	2.60	7.25	$8\frac{3}{8}$	$4\frac{3}{16}$
$4\frac{9}{64}$	2.70	7.75	$8\frac{23}{32}$	$4\frac{23}{64}$
$2\frac{5}{32}$	2.70	7.75	$8\frac{23}{32}$	$4\frac{23}{64}$
$5\frac{1}{64}$	2.80	7.75	$9\frac{1}{16}$	$4\frac{17}{32}$
$1\frac{3}{16}$	2.80	7.75	$9\frac{1}{16}$	$4\frac{17}{32}$
$5\frac{3}{64}$	2.95	8.50	$9\frac{3}{8}$	$4\frac{11}{16}$
$2\frac{7}{32}$	2.95	8.50	$9\frac{3}{8}$	$4\frac{11}{16}$
$5\frac{5}{64}$	3.10	8.50	$9\frac{11}{16}$	$4\frac{27}{32}$
$7\frac{7}{8}$	3.10	8.50	$9\frac{11}{16}$	$4\frac{27}{32}$
$5\frac{7}{64}$	3.25	9.50	$10\frac{3}{32}$	$5\frac{3}{64}$
$2\frac{9}{32}$	3.25	9.50	$10\frac{3}{32}$	$5\frac{3}{64}$
$5\frac{9}{64}$	3.40	9.50	$10\frac{1}{4}$	$5\frac{1}{8}$
$1\frac{5}{16}$	3.40	9.50	$10\frac{1}{4}$	$5\frac{1}{8}$
$6\frac{1}{64}$	3.55	10.50	$10\frac{11}{16}$	$5\frac{11}{32}$
$3\frac{1}{32}$	3.55	10.50	$10\frac{11}{16}$	$5\frac{11}{32}$
$6\frac{3}{64}$	3.70	10.50	$10\frac{7}{8}$	$5\frac{7}{16}$
1	3.70	10.50	$10\frac{7}{8}$	$5\frac{7}{16}$
$1\frac{1}{32}$	3.85	11.50	$11\frac{1}{16}$	$5\frac{17}{32}$
$1\frac{1}{16}$	4.00	11.50	$11\frac{1}{4}$	$5\frac{5}{8}$
$1\frac{3}{32}$	4.15	12.75	$11\frac{7}{16}$	$5\frac{23}{32}$
$1\frac{1}{8}$	4.30	12.75	$11\frac{5}{8}$	$5\frac{13}{16}$
$1\frac{5}{32}$	4.45	14.25	$11\frac{13}{16}$	$5\frac{29}{32}$
$1\frac{3}{16}$	4.60	14.25	12	6
$1\frac{7}{32}$	4.75	15.75	$12\frac{1}{8}$	$6\frac{1}{16}$
$1\frac{1}{4}$	4.90	15.75	$12\frac{1}{4}$	$6\frac{1}{8}$
$1\frac{9}{32}$	5.05	17.25	$12\frac{11}{32}$	$6\frac{11}{64}$
$1\frac{5}{16}$	5.20	17.25	$12\frac{7}{16}$	$6\frac{7}{32}$
$1\frac{11}{32}$	5.40	18.75	$12\frac{17}{32}$	$6\frac{17}{64}$
$1\frac{3}{8}$	5.60	18.75	$12\frac{5}{8}$	$6\frac{5}{16}$
$1\frac{13}{32}$	5.80	20.50	$12\frac{23}{32}$	$6\frac{23}{64}$
$1\frac{7}{16}$	6.00	20.50	$12\frac{13}{16}$	$6\frac{13}{32}$
$1\frac{15}{32}$	6.20	22.25	$12\frac{29}{32}$	$6\frac{29}{64}$
$1\frac{1}{2}$	6.40	22.25	13	$6\frac{1}{2}$
$1\frac{17}{32}$	6.60	24.00	13	$6\frac{1}{2}$
$1\frac{9}{16}$	6.80	24.00	13	$6\frac{1}{2}$
$1\frac{19}{32}$	7.00	25.75	13	$6\frac{1}{2}$
$1\frac{5}{8}$	7.20	25.75	13	$6\frac{1}{2}$
$1\frac{21}{32}$	7.40	27.50	$13\frac{1}{2}$	$6\frac{3}{4}$
$1\frac{11}{16}$	7.60	27.50	$13\frac{1}{2}$	$6\frac{3}{4}$
$1\frac{23}{32}$	7.80	29.50	$13\frac{1}{2}$	$6\frac{3}{4}$
$1\frac{3}{4}$	8.00	29.50	$13\frac{1}{2}$	$6\frac{3}{4}$

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Hand Reamers

No. 400
(Concluded)

Diameter Inches	Price Each		Length overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
1 ²⁵ / ₃₂	\$8.20	\$31.50	13 ¹ / ₂	6 ³ / ₄
1 ¹³ / ₁₆	8.40	31.50	13 ¹ / ₂	6 ³ / ₄
1 ²⁷ / ₃₂	8.60	33.50	13 ¹ / ₂	6 ³ / ₄
1 ⁷ / ₈	8.80	33.50	14	7
1 ²⁹ / ₃₂	9.00	35.75	14	7
1 ¹⁵ / ₁₆	9.20	35.75	14	7
1 ³¹ / ₃₂	9.40	38.00	14	7
2	9.60	38.00	14	7
2 ¹ / ₁₆	10.00	40.75	14 ¹ / ₂	7 ¹ / ₄
2 ¹ / ₈	10.40	43.50	14 ¹ / ₂	7 ¹ / ₄
2 ³ / ₁₆	10.80	46.25	15	7 ¹ / ₂
2 ¹ / ₄	11.30	49.00	15	7 ¹ / ₂
2 ⁵ / ₁₆	11.80	51.75	15	7 ¹ / ₂
2 ³ / ₈	12.30	55.00	15	7 ¹ / ₂
2 ⁷ / ₁₆	12.80	58.25	15 ¹ / ₂	7 ³ / ₄
2 ¹ / ₂	13.40	61.50	15 ¹ / ₂	7 ³ / ₄
2 ⁹ / ₁₆	14.00	64.75	15 ¹ / ₂	7 ³ / ₄
2 ⁵ / ₈	14.60	68.00	16	8
2 ¹¹ / ₁₆	15.40	71.25	16	8
2 ³ / ₄	16.20	74.50	16	8
2 ¹³ / ₁₆	17.00	77.75	16 ¹ / ₂	8 ¹ / ₄
2 ⁷ / ₈	17.80	81.00	16 ¹ / ₂	8 ¹ / ₄
2 ¹⁵ / ₁₆	18.60	84.25	16 ¹ / ₂	8 ¹ / ₄
3	19.40	87.50	16 ¹ / ₂	8 ¹ / ₄

Solid Hand Reamers in Sets

(Carbon Steel)
Contained in Hardwood Cases

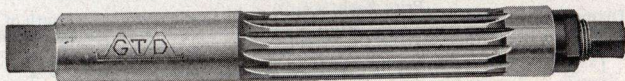


No. 401	9 Sizes	1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4 . . .	\$20.00
402	13 Sizes	1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1	33.00
403	8 Sizes	1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2	44.00



Expansion Hand Reamers

No. 415



The maximum expansion on these reamers is as follows:

$\frac{1}{4}$ to $1\frac{9}{32}$ inclusive .005 inch
 $\frac{5}{8}$ to 1" inclusive .008 inch

All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diam. Inches	Price Each	Length Overall Inches	Length of Flute Inches
$\frac{1}{4}$	\$3.00	4	$1\frac{1}{2}$
$\frac{17}{64}$	3.05	4	$1\frac{1}{2}$
$\frac{9}{32}$	3.05	4	$1\frac{1}{2}$
$\frac{19}{64}$	3.10	4	$1\frac{1}{2}$
$\frac{5}{16}$	3.10	4	$1\frac{1}{2}$
$\frac{21}{64}$	3.15	5	$1\frac{3}{4}$
$\frac{11}{32}$	3.15	5	$1\frac{3}{4}$
$\frac{23}{64}$	3.20	5	$1\frac{3}{4}$
$\frac{3}{8}$	3.20	5	$1\frac{3}{4}$
$\frac{25}{64}$	3.25	5	$1\frac{3}{4}$
$\frac{13}{32}$	3.25	5	$1\frac{3}{4}$
$\frac{27}{64}$	3.30	5	$1\frac{3}{4}$
$\frac{7}{16}$	3.30	5	$1\frac{3}{4}$
$\frac{29}{64}$	3.35	6	$2\frac{1}{4}$
$\frac{15}{32}$	3.35	6	$2\frac{1}{4}$
$\frac{31}{64}$	3.40	6	$2\frac{1}{4}$
$\frac{1}{2}$	3.40	6	$2\frac{1}{4}$
$\frac{33}{64}$	3.50	6	$2\frac{1}{4}$
$\frac{17}{32}$	3.50	6	$2\frac{1}{4}$
$\frac{35}{64}$	3.65	6	$2\frac{1}{4}$
$\frac{9}{16}$	3.65	6	$2\frac{1}{4}$
$\frac{37}{64}$	3.80	6	$2\frac{1}{4}$
$\frac{19}{32}$	3.80	6	$2\frac{1}{4}$
$\frac{39}{64}$	4.00	6	$2\frac{1}{4}$
$\frac{5}{8}$	4.00	6	$2\frac{1}{4}$
$\frac{41}{64}$	4.20	7	$2\frac{5}{8}$
$\frac{21}{32}$	4.20	7	$2\frac{5}{8}$
$\frac{43}{64}$	4.40	7	$2\frac{5}{8}$
$\frac{11}{16}$	4.40	7	$2\frac{5}{8}$
$\frac{45}{64}$	4.60	7	$2\frac{5}{8}$
$\frac{23}{32}$	4.60	7	$2\frac{5}{8}$
$\frac{47}{64}$	4.80	7	$2\frac{5}{8}$
$\frac{3}{4}$	4.80	7	$2\frac{5}{8}$
$\frac{49}{64}$	5.00	7	$2\frac{5}{8}$
$\frac{25}{12}$	5.00	7	$2\frac{5}{8}$



Expansion Hand Reamers

No. 415
Sizes and Prices

Diam. Inches	Price Each	Length Overall Inches	Length of Flute Inches
$51/64$	\$5.25	7	$25/8$
$13/16$	5.25	7	$25/8$
$53/64$	5.50	8	$31/8$
$27/32$	5.50	8	$31/8$
$55/64$	5.75	8	$31/8$
$7/8$	5.75	8	$31/8$
$57/64$	6.00	8	$31/8$
$29/32$	6.00	8	$31/8$
$59/64$	6.25	8	$31/8$
$15/16$	6.25	8	$31/8$
$61/64$	6.50	8	$31/8$
$31/32$	6.50	8	$31/8$
$63/64$	6.75	8	$31/8$
1	6.75	8	$31/8$
$11/32$	7.25	9	$39/16$
$11/16$	7.25	9	$39/16$
$13/32$	7.75	9	$39/16$
$17/8$	7.75	9	$39/16$
$15/32$	8.30	9	$39/16$
$13/16$	8.30	9	$39/16$
$17/32$	8.90	10	$41/4$
$17/4$	8.90	10	$41/4$
$19/32$	9.50	11	$51/4$
$15/16$	9.50	11	$51/4$
$111/32$	10.50	11	$51/2$
$13/8$	10.50	11	$51/2$
$113/32$	11.50	11	$53/4$
$17/16$	11.50	11	$53/4$
$115/32$	12.50	11	6
$11/2$	12.50	11	6
$19/16$	13.00	$111/4$	6
$13/8$	13.50	$111/2$	6
$111/16$	14.00	$115/8$	6
$13/4$	14.50	$117/8$	6
$113/16$	15.00	$121/16$	6
$17/8$	15.50	$121/4$	6
$115/16$	16.00	$123/8$	6
2	16.50	$129/16$	6
$21/8$	17.50	$123/4$	6
$21/4$	18.50	13	6
$23/8$	19.50	$131/2$	6
$21/2$	20.50	14	6

Taper Shank Jobbers' Reamers

No. 409



Taper Shank Jobbers' Reamers with threaded ends or spiral flutes and all sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{1}{4}$	\$1.70	\$4.00	$5\frac{3}{16}$	2	1
$\frac{17}{64}$	1.75	4.25	$5\frac{3}{16}$	2	1
$\frac{9}{32}$	1.75	4.25	$5\frac{3}{16}$	2	1
$\frac{19}{64}$	1.80	4.25	$5\frac{1}{2}$	$2\frac{1}{4}$	1
$\frac{5}{16}$	1.80	4.25	$5\frac{1}{2}$	$2\frac{1}{4}$	1
$\frac{21}{64}$	1.85	4.75	$5\frac{1}{2}$	$2\frac{1}{4}$	1
$\frac{11}{32}$	1.85	4.75	$5\frac{1}{2}$	$2\frac{1}{4}$	1
$\frac{23}{64}$	1.90	4.75	$5\frac{13}{16}$	$2\frac{1}{2}$	1
$\frac{3}{8}$	1.90	4.75	$5\frac{13}{16}$	$2\frac{1}{2}$	1
$\frac{25}{64}$	2.05	5.25	$5\frac{13}{16}$	$2\frac{1}{2}$	1
$\frac{13}{32}$	2.05	5.25	$5\frac{13}{16}$	$2\frac{1}{2}$	1
$\frac{27}{64}$	2.15	5.25	$6\frac{1}{8}$	$2\frac{3}{4}$	1
$\frac{7}{16}$	2.15	5.25	$6\frac{1}{8}$	$2\frac{3}{4}$	1
$\frac{29}{64}$	2.20	5.75	$6\frac{1}{8}$	$2\frac{3}{4}$	1
$\frac{15}{32}$	2.20	5.75	$6\frac{1}{8}$	$2\frac{3}{4}$	1
$\frac{31}{64}$	2.30	5.75	$6\frac{7}{16}$	3	1
$\frac{1}{2}$	2.30	5.75	$6\frac{7}{16}$	3	1
$\frac{17}{32}$	2.35	6.25	$6\frac{7}{16}$	3	1
$\frac{9}{16}$	2.40	6.25	$6\frac{3}{4}$	$3\frac{1}{4}$	1
$\frac{19}{32}$	2.50	6.75	$6\frac{3}{4}$	$3\frac{1}{4}$	1
$\frac{5}{8}$	2.65	6.75	$7\frac{9}{16}$	$3\frac{1}{2}$	2
$\frac{21}{32}$	2.75	7.25	$7\frac{9}{16}$	$3\frac{1}{2}$	2
$\frac{11}{16}$	2.90	7.25	8	$3\frac{7}{8}$	2
$\frac{23}{32}$	3.00	7.75	8	$3\frac{7}{8}$	2
$\frac{3}{4}$	3.10	7.75	$8\frac{3}{8}$	$4\frac{3}{16}$	2
$\frac{25}{32}$	3.25	8.50	$8\frac{3}{8}$	$4\frac{3}{16}$	2
$\frac{13}{16}$	3.35	8.50	$8\frac{13}{16}$	$4\frac{9}{16}$	2
$\frac{27}{32}$	3.55	9.50	$8\frac{13}{16}$	$4\frac{9}{16}$	2
$\frac{7}{8}$	3.70	9.50	$9\frac{3}{16}$	$4\frac{7}{8}$	2
$\frac{29}{32}$	3.90	10.50	$9\frac{3}{16}$	$4\frac{7}{8}$	2

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Taper Shank Jobbers' Reamers

No. 409

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Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{15}{16}$	\$4.10	\$10.50	10	$5\frac{1}{8}$	3
$\frac{31}{32}$	4.25	11.50	10	$5\frac{1}{8}$	3
1	4.45	11.50	$10\frac{3}{8}$	$5\frac{7}{16}$	3
$1\frac{1}{32}$	4.60	12.50	$10\frac{3}{8}$	$5\frac{7}{16}$	3
$1\frac{1}{16}$	4.80	12.50	$10\frac{5}{8}$	$5\frac{5}{8}$	3
$1\frac{3}{32}$	5.00	13.75	$10\frac{5}{8}$	$5\frac{5}{8}$	3
$1\frac{1}{8}$	5.15	13.75	$10\frac{7}{8}$	$5\frac{13}{16}$	3
$1\frac{5}{32}$	5.35	15.25	$10\frac{7}{8}$	$5\frac{13}{16}$	3
$1\frac{3}{16}$	5.50	15.25	$11\frac{1}{8}$	6	3
$1\frac{7}{32}$	5.70	16.75	$11\frac{1}{8}$	6	3
$1\frac{1}{4}$	5.90	16.75	$12\frac{9}{16}$	$6\frac{1}{8}$	4
$1\frac{9}{32}$	6.05	18.25	$12\frac{9}{16}$	$6\frac{1}{8}$	4
$1\frac{5}{16}$	6.25	18.25	$12\frac{11}{16}$	$6\frac{1}{4}$	4
$1\frac{11}{32}$	6.50	19.75	$12\frac{11}{16}$	$6\frac{1}{4}$	4
$1\frac{3}{8}$	6.70	19.75	$12\frac{13}{16}$	$6\frac{5}{16}$	4
$1\frac{13}{32}$	6.95	21.50	$12\frac{13}{16}$	$6\frac{5}{16}$	4
$1\frac{7}{16}$	7.20	21.50	13	$6\frac{7}{16}$	4
$1\frac{15}{32}$	7.45	23.25	13	$6\frac{7}{16}$	4
$1\frac{1}{2}$	7.70	23.25	$13\frac{1}{8}$	$6\frac{1}{2}$	4
$1\frac{17}{32}$	7.90	25.00	$13\frac{1}{8}$	$6\frac{1}{2}$	4
$1\frac{9}{16}$	8.15	25.00	$13\frac{1}{8}$	$6\frac{1}{2}$	4
$1\frac{19}{32}$	8.40	26.75	$13\frac{1}{8}$	$6\frac{1}{2}$	4
$1\frac{5}{8}$	8.65	26.75	$13\frac{1}{8}$	$6\frac{1}{2}$	4
$1\frac{21}{32}$	8.90	28.50	$13\frac{3}{8}$	$6\frac{1}{2}$	4
$1\frac{11}{16}$	9.10	28.50	$13\frac{3}{8}$	$6\frac{3}{4}$	4
$1\frac{23}{32}$	9.35	30.50	$13\frac{3}{8}$	$6\frac{3}{4}$	4
$1\frac{3}{4}$	9.60	30.50	$14\frac{1}{16}$	$6\frac{3}{4}$	5
$1\frac{25}{32}$	9.85	32.50	$14\frac{1}{16}$	$6\frac{3}{4}$	5
$1\frac{13}{16}$	10.10	32.50	$14\frac{1}{16}$	$6\frac{3}{4}$	5
$1\frac{27}{32}$	10.30	34.50	$14\frac{1}{16}$	$6\frac{3}{4}$	5
$1\frac{7}{8}$	10.55	34.50	15	7	5
$1\frac{29}{32}$	10.80	36.75	15	7	5
$1\frac{15}{16}$	11.05	36.75	15	7	5
$1\frac{31}{32}$	11.30	39.00	15	7	5
2	11.50	39.00	15	7	5

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248.



Fluted Chucking Reamers

With Straight Shank

No. 2216



All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{1}{8}$	\$.90	\$2.00	$3\frac{1}{2}$	$\frac{7}{8}$
$\frac{5}{32}$	.95	2.25	4	1
$\frac{3}{16}$	1.00	2.50	$4\frac{1}{2}$	$1\frac{1}{8}$
$\frac{7}{32}$	1.10	2.75	5	$1\frac{1}{4}$
$\frac{1}{4}$	1.20	3.00	6	$1\frac{1}{2}$
$\frac{9}{32}$	1.30	3.25	6	$1\frac{1}{2}$
$\frac{5}{16}$	1.30	3.25	6	$1\frac{1}{2}$
$\frac{11}{32}$	1.45	3.75	6	$1\frac{1}{2}$
$\frac{3}{8}$	1.45	3.75	7	$1\frac{3}{4}$
$\frac{13}{32}$	1.60	4.25	7	$1\frac{3}{4}$
$\frac{7}{16}$	1.60	4.25	7	$1\frac{3}{4}$
$\frac{15}{32}$	1.80	4.75	7	$1\frac{3}{4}$
$\frac{1}{2}$	1.80	4.75	8	2
$\frac{17}{32}$	2.00	5.25	8	2
$\frac{9}{16}$	2.00	5.25	8	2
$\frac{19}{32}$	2.25	5.75	8	2
$\frac{5}{8}$	2.25	5.75	9	$2\frac{1}{4}$
$\frac{21}{32}$	2.40	6.25	9	$2\frac{1}{4}$
$\frac{11}{16}$	2.40	6.25	9	$2\frac{1}{4}$
$\frac{23}{32}$	2.55	6.75	9	$2\frac{1}{4}$
$\frac{3}{4}$	2.55	6.75	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{25}{32}$	2.80	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{13}{16}$	2.80	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{27}{32}$	3.00	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$

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Fluted Chucking Reamers

With Straight Shank

No. 2216

(Concluded)

Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{7}{8}$	\$3.00	\$8.00	10	$2\frac{5}{8}$
$\frac{29}{32}$	3.25	9.00	10	$2\frac{5}{8}$
$\frac{15}{16}$	3.25	9.00	10	$2\frac{5}{8}$
$\frac{31}{32}$	3.45	10.00	10	$2\frac{5}{8}$
1	3.45	10.00	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{32}$	3.70	11.25	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{16}$	3.70	11.25	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{3}{32}$	3.90	12.50	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{8}$	3.90	12.50	11	$2\frac{7}{8}$
$1\frac{5}{32}$	4.15	13.75	11	$2\frac{7}{8}$
$1\frac{3}{16}$	4.15	13.75	11	$2\frac{7}{8}$
$1\frac{7}{32}$	4.35	15.25	11	$2\frac{7}{8}$
$1\frac{1}{4}$	4.35	15.25	$11\frac{1}{2}$	3
$1\frac{5}{16}$	4.60	17.00	$11\frac{1}{2}$	3
$1\frac{3}{8}$	4.80	18.75	12	$3\frac{1}{4}$
$1\frac{7}{16}$	5.05	20.50	12	$3\frac{1}{4}$
$1\frac{1}{2}$	5.25	22.25	$12\frac{1}{2}$	$3\frac{1}{2}$
$1\frac{9}{16}$	5.50	24.00	$12\frac{1}{2}$	$3\frac{1}{2}$
$1\frac{5}{8}$	5.75	25.75	13	$3\frac{3}{4}$
$1\frac{11}{16}$	6.00	27.50	13	$3\frac{3}{4}$
$1\frac{3}{4}$	6.30	29.50	$13\frac{1}{2}$	4
$1\frac{13}{16}$	6.60	31.50	$13\frac{1}{2}$	4
$1\frac{7}{8}$	6.90	33.50	14	$4\frac{1}{4}$
$1\frac{15}{16}$	7.20	35.75	14	$4\frac{1}{4}$
2	7.50	38.00	14	$4\frac{1}{4}$

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248.



Fluted Chucking Reamers

With Morse Taper Shank

No. 2217



All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{1}{4}$	\$1.45	\$3.50	6	$1\frac{1}{2}$	1
$\frac{9}{32}$	1.55	3.75	6	$1\frac{1}{2}$	1
$\frac{5}{16}$	1.55	3.75	6	$1\frac{1}{2}$	1
$\frac{11}{32}$	1.75	4.25	6	$1\frac{1}{2}$	1
$\frac{3}{8}$	1.75	4.25	7	$1\frac{3}{4}$	1
$\frac{13}{32}$	1.90	4.75	7	$1\frac{3}{4}$	1
$\frac{7}{16}$	1.90	4.75	7	$1\frac{3}{4}$	1
$\frac{15}{32}$	2.15	5.25	7	$1\frac{3}{4}$	1
$\frac{1}{2}$	2.15	5.25	8	2	1
$\frac{17}{32}$	2.40	5.75	8	2	1
$\frac{9}{16}$	2.40	5.75	8	2	1
$\frac{19}{32}$	2.70	6.25	8	2	1
$\frac{5}{8}$	2.70	6.25	9	$2\frac{1}{4}$	2
$\frac{21}{32}$	2.90	6.75	9	$2\frac{1}{4}$	2
$\frac{11}{16}$	2.90	6.75	9	$2\frac{1}{4}$	2
$\frac{23}{32}$	3.05	7.25	9	$2\frac{1}{4}$	2
$\frac{3}{4}$	3.05	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{25}{32}$	3.35	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{13}{16}$	3.35	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{27}{32}$	3.60	9.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2

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Fluted Chucking Reamers

With Morse Taper Shank

No. 2217

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Sizes and Prices

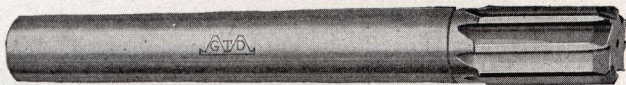
Diam. Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{7}{8}$	\$3.60	\$9.00	10	$2\frac{5}{8}$	2
$\frac{29}{32}$	3.90	10.00	10	$2\frac{5}{8}$	2
$\frac{15}{16}$	3.90	10.00	10	$2\frac{5}{8}$	3
$\frac{31}{32}$	4.15	11.00	10	$2\frac{5}{8}$	3
1	4.15	11.00	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{32}$	4.45	12.25	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{16}$	4.45	12.25	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{3}{32}$	4.70	13.50	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{8}$	4.70	13.50	11	$2\frac{7}{8}$	3
$1\frac{5}{32}$	5.00	14.75	11	$2\frac{7}{8}$	3
$1\frac{3}{16}$	5.00	14.75	11	$2\frac{7}{8}$	3
$1\frac{7}{32}$	5.20	16.25	11	$2\frac{7}{8}$	3
$1\frac{1}{4}$	5.20	16.25	$11\frac{1}{2}$	3	4
$1\frac{5}{16}$	5.50	18.00	$11\frac{1}{2}$	3	4
$1\frac{3}{8}$	5.75	19.75	12	$3\frac{1}{4}$	4
$1\frac{7}{16}$	6.05	21.50	12	$3\frac{1}{4}$	4
$1\frac{1}{2}$	6.30	23.25	$12\frac{1}{2}$	$3\frac{1}{2}$	4
$1\frac{9}{16}$	6.60	25.00	$12\frac{1}{2}$	$3\frac{1}{2}$	4
$1\frac{5}{8}$	6.90	26.75	13	$3\frac{3}{4}$	4
$1\frac{11}{16}$	7.20	28.50	13	$3\frac{3}{4}$	4
$1\frac{3}{4}$	7.55	30.50	$13\frac{1}{2}$	4	5
$1\frac{13}{16}$	7.90	32.50	$13\frac{1}{2}$	4	5
$1\frac{7}{8}$	8.30	34.50	14	$4\frac{1}{4}$	5
$1\frac{15}{16}$	8.65	36.75	14	$4\frac{1}{4}$	5
2	9.00	39.00	14	$4\frac{1}{4}$	5

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248.



Rose Chucking Reamers

With Straight Shank



No. 2215

All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{1}{8}$	\$.90	\$2.00	$3\frac{1}{2}$	$\frac{7}{8}$
$\frac{5}{32}$	.95	2.25	4	1
$\frac{3}{16}$	1.00	2.50	$4\frac{1}{2}$	$1\frac{1}{8}$
$\frac{7}{32}$	1.10	2.75	5	$1\frac{1}{4}$
$\frac{1}{4}$	1.20	3.00	6	$1\frac{1}{2}$
$\frac{9}{32}$	1.30	3.25	6	$1\frac{1}{2}$
$\frac{5}{16}$	1.30	3.25	6	$1\frac{1}{2}$
$\frac{11}{32}$	1.45	3.75	6	$1\frac{1}{2}$
$\frac{3}{8}$	1.45	3.75	7	$1\frac{3}{4}$
$\frac{13}{32}$	1.60	4.25	7	$1\frac{3}{4}$
$\frac{7}{16}$	1.60	4.25	7	$1\frac{3}{4}$
$\frac{15}{32}$	1.80	4.75	7	$1\frac{3}{4}$
$\frac{1}{2}$	1.80	4.75	8	2
$\frac{17}{32}$	2.00	5.25	8	2
$\frac{9}{16}$	2.00	5.25	8	2
$\frac{19}{32}$	2.25	5.75	8	2
$\frac{5}{8}$	2.25	5.75	9	$2\frac{1}{4}$
$\frac{21}{32}$	2.40	6.25	9	$2\frac{1}{4}$
$\frac{11}{16}$	2.40	6.25	9	$2\frac{1}{4}$
$\frac{23}{32}$	2.55	6.75	9	$2\frac{1}{4}$
$\frac{3}{4}$	2.55	6.75	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{25}{32}$	2.80	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{13}{16}$	2.80	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$
$\frac{27}{32}$	3.00	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$

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Rose Chucking Reamers

With Straight Shank

No. 2215

(Concluded)

Sizes and Prices

Diameter Inches	Price Each		Length Overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{7}{8}$	\$3.00	\$8.00	10	$2\frac{5}{8}$
$\frac{29}{32}$	3.25	9.00	10	$2\frac{5}{8}$
$\frac{15}{16}$	3.25	9.00	10	$2\frac{5}{8}$
$\frac{31}{32}$	3.45	10.00	10	$2\frac{5}{8}$
1	3.45	10.00	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{32}$	3.70	11.25	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{16}$	3.70	11.25	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{3}{32}$	3.90	12.50	$10\frac{1}{2}$	$2\frac{3}{4}$
$1\frac{1}{8}$	3.90	12.50	11	$2\frac{7}{8}$
$1\frac{5}{32}$	4.15	13.75	11	$2\frac{7}{8}$
$1\frac{3}{16}$	4.15	13.75	11	$2\frac{7}{8}$
$1\frac{7}{32}$	4.35	15.25	11	$2\frac{7}{8}$
$1\frac{1}{4}$	4.35	15.25	$11\frac{1}{2}$	3
$1\frac{5}{16}$	4.60	17.00	$11\frac{1}{2}$	3
$1\frac{3}{8}$	4.80	18.75	12	$3\frac{1}{4}$
$1\frac{7}{16}$	5.05	20.50	12	$3\frac{1}{4}$
$1\frac{1}{2}$	5.25	22.25	$12\frac{1}{2}$	$3\frac{1}{2}$
$1\frac{9}{16}$	5.50	24.00	$12\frac{1}{2}$	$3\frac{1}{2}$
$1\frac{5}{8}$	5.75	25.75	13	$3\frac{3}{4}$
$1\frac{11}{16}$	6.00	27.50	13	$3\frac{3}{4}$
$1\frac{3}{4}$	6.30	29.50	$13\frac{1}{2}$	4
$1\frac{13}{16}$	6.60	31.50	$13\frac{1}{2}$	4
$1\frac{7}{8}$	6.90	33.50	14	$4\frac{1}{4}$
$1\frac{15}{16}$	7.20	35.75	14	$4\frac{1}{4}$
2	7.50	38.00	14	$4\frac{1}{4}$

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248.



Rose Chucking Reamers

With Morse Taper Shank

No. 2214



All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{1}{4}$	\$1.45	\$3.50	6	$1\frac{1}{2}$	1
$\frac{9}{32}$	1.55	3.75	6	$1\frac{1}{2}$	1
$\frac{5}{16}$	1.55	3.75	6	$1\frac{1}{2}$	1
$\frac{11}{32}$	1.75	4.25	6	$1\frac{1}{2}$	1
$\frac{3}{8}$	1.75	4.25	7	$1\frac{3}{4}$	1
$\frac{13}{32}$	1.90	4.75	7	$1\frac{3}{4}$	1
$\frac{7}{16}$	1.90	4.75	7	$1\frac{3}{4}$	1
$\frac{15}{32}$	2.15	5.25	7	$1\frac{3}{4}$	1
$\frac{1}{2}$	2.15	5.25	8	2	1
$\frac{17}{32}$	2.40	5.75	8	2	1
$\frac{9}{16}$	2.40	5.75	8	2	1
$\frac{19}{32}$	2.70	6.25	8	2	1
$\frac{5}{8}$	2.70	6.25	9	$2\frac{1}{4}$	2
$\frac{21}{32}$	2.90	6.75	9	$2\frac{1}{4}$	2
$\frac{11}{16}$	2.90	6.75	9	$2\frac{1}{4}$	2
$\frac{23}{32}$	3.05	7.25	9	$2\frac{1}{4}$	2
$\frac{3}{4}$	3.05	7.25	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{25}{32}$	3.35	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{13}{16}$	3.35	8.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2
$\frac{27}{32}$	3.60	9.00	$9\frac{1}{2}$	$2\frac{1}{2}$	2

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Rose Chucking Reamers

With Morse Taper Shank

No. 2214

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Sizes and Prices

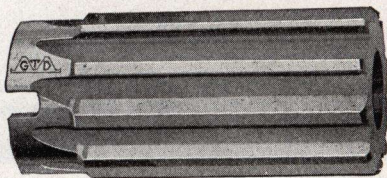
Diam. Inches	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{7}{8}$	\$3.60	\$9.00	10	$2\frac{5}{8}$	2
$\frac{29}{32}$	3.90	10.00	10	$2\frac{5}{8}$	2
$\frac{15}{16}$	3.90	10.00	10	$2\frac{5}{8}$	3
$\frac{31}{32}$	4.15	11.00	10	$2\frac{5}{8}$	3
1	4.15	11.00	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{32}$	4.45	12.25	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{16}$	4.45	12.25	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{3}{32}$	4.70	13.50	$10\frac{1}{2}$	$2\frac{3}{4}$	3
$1\frac{1}{8}$	4.70	13.50	11	$2\frac{7}{8}$	3
$1\frac{5}{32}$	5.00	14.75	11	$2\frac{7}{8}$	3
$1\frac{3}{16}$	5.00	14.75	11	$2\frac{7}{8}$	3
$1\frac{7}{32}$	5.20	16.25	11	$2\frac{7}{8}$	3
$1\frac{1}{4}$	5.20	16.25	$11\frac{1}{2}$	3	4
$1\frac{5}{16}$	5.50	18.00	$11\frac{1}{2}$	3	4
$1\frac{3}{8}$	5.75	19.75	12	$3\frac{1}{4}$	4
$1\frac{7}{16}$	6.05	21.50	12	$3\frac{1}{4}$	4
$1\frac{1}{2}$	6.30	23.25	$12\frac{1}{2}$	$3\frac{1}{2}$	4
$1\frac{9}{16}$	6.60	25.00	$12\frac{1}{2}$	$3\frac{1}{2}$	4
$1\frac{5}{8}$	6.90	26.75	13	$3\frac{3}{4}$	4
$1\frac{11}{16}$	7.20	28.50	13	$3\frac{3}{4}$	4
$1\frac{3}{4}$	7.55	30.50	$13\frac{1}{2}$	4	5
$1\frac{13}{16}$	7.90	32.50	$13\frac{1}{2}$	4	5
$1\frac{7}{8}$	8.30	34.50	14	$4\frac{1}{4}$	5
$1\frac{15}{16}$	8.65	36.75	14	$4\frac{1}{4}$	5
2	9.00	39.00	14	$4\frac{1}{4}$	5

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248.



Fluted Shell Reamers

No. 421



These reamers are for sizing or finishing. The lands are sharpened and relieved for their full length.

All sizes and dimensions not listed are special and subject to special prices.

For shell reamer arbors, see page 180.

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
$\frac{1}{2}$	\$1.70	\$3.25	2	$\frac{1}{4}$	3
$\frac{17}{32}$	1.80	3.40	2	$\frac{1}{4}$	3
$\frac{9}{16}$	1.80	3.40	2	$\frac{1}{4}$	3
$\frac{19}{32}$	1.90	3.55	2	$\frac{1}{4}$	3
$\frac{5}{8}$	1.90	3.55	2	$\frac{1}{4}$	3
$\frac{21}{32}$	2.00	3.70	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{11}{16}$	2.00	3.70	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{23}{32}$	2.10	3.85	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{3}{4}$	2.10	3.85	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{25}{32}$	2.20	4.00	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{13}{16}$	2.20	4.00	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{27}{32}$	2.30	4.25	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{7}{8}$	2.30	4.25	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{29}{32}$	2.40	4.50	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{15}{16}$	2.40	4.50	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{31}{32}$	2.50	4.75	$2\frac{1}{2}$	$\frac{1}{2}$	5
1	2.50	4.75	$2\frac{1}{2}$	$\frac{1}{2}$	5
$1\frac{1}{32}$	2.70	5.00	$2\frac{1}{2}$	$\frac{1}{2}$	5
$1\frac{1}{16}$	2.70	5.00	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{3}{32}$	2.90	5.25	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{1}{8}$	2.90	5.25	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{5}{32}$	3.10	5.50	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{3}{16}$	3.10	5.50	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{7}{32}$	3.30	5.75	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{1}{4}$	3.30	5.75	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{9}{32}$	3.55	6.00	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{5}{16}$	3.55	6.00	3	$\frac{3}{4}$	7

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Fluted Shell Reamers

No. 421

(Continued)

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
1 $\frac{11}{32}$	\$3.80	\$6.50	3	$\frac{3}{4}$	7
1 $\frac{3}{8}$	3.80	6.50	3	$\frac{3}{4}$	7
1 $\frac{13}{32}$	4.05	7.00	3	$\frac{3}{4}$	7
1 $\frac{7}{16}$	4.05	7.00	3	$\frac{3}{4}$	7
1 $\frac{15}{32}$	4.30	7.50	3	$\frac{3}{4}$	7
1 $\frac{1}{2}$	4.30	7.50	3	$\frac{3}{4}$	7
1 $\frac{17}{32}$	4.55	8.25	3	$\frac{3}{4}$	7
1 $\frac{9}{16}$	4.55	8.25	3	$\frac{3}{4}$	7
1 $\frac{19}{32}$	4.80	9.00	3	$\frac{3}{4}$	7
1 $\frac{5}{8}$	4.80	9.00	3	$\frac{3}{4}$	7
1 $\frac{21}{32}$	5.10	9.75	3	$\frac{3}{4}$	7
1 $\frac{11}{16}$	5.10	9.75	3 $\frac{1}{2}$	1	8
1 $\frac{23}{32}$	5.40	10.50	3 $\frac{1}{2}$	1	8
1 $\frac{3}{4}$	5.40	10.50	3 $\frac{1}{2}$	1	8
1 $\frac{25}{32}$	5.70	11.25	3 $\frac{1}{2}$	1	8
1 $\frac{13}{16}$	5.70	11.25	3 $\frac{1}{2}$	1	8
1 $\frac{27}{32}$	6.00	12.00	3 $\frac{1}{2}$	1	8
1 $\frac{7}{8}$	6.00	12.00	3 $\frac{1}{2}$	1	8
1 $\frac{29}{32}$	6.30	12.75	3 $\frac{1}{2}$	1	8
1 $\frac{15}{16}$	6.30	12.75	3 $\frac{1}{2}$	1	8
1 $\frac{31}{32}$	6.60	13.50	3 $\frac{1}{2}$	1	8
2	6.60	13.50	3 $\frac{1}{2}$	1	8
2 $\frac{1}{16}$	6.95	14.25	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{1}{8}$	7.30	15.00	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{3}{16}$	7.65	15.75	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{1}{4}$	8.00	16.50	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{5}{16}$	8.35	17.25	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{3}{8}$	8.70	18.00	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{7}{16}$	9.05	18.75	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{1}{2}$	9.40	19.50	3 $\frac{3}{4}$	1 $\frac{1}{4}$	9
2 $\frac{9}{16}$	9.80	20.50	4	1 $\frac{1}{2}$	10
2 $\frac{5}{8}$	10.20	21.75	4	1 $\frac{1}{2}$	10
2 $\frac{11}{16}$	10.60	23.00	4	1 $\frac{1}{2}$	10
2 $\frac{3}{4}$	11.00	24.25	4	1 $\frac{1}{2}$	10
2 $\frac{13}{16}$	11.40	25.50	4	1 $\frac{1}{2}$	10

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Fluted Shell Reamers

No. 421

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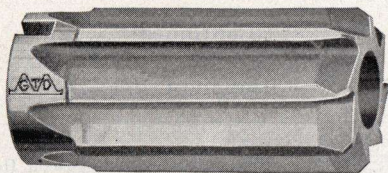
Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
2 ⁷ / ₈	\$11.80	\$27.00	4	1 ¹ / ₂	10
2 ¹⁵ / ₁₆	12.20	28.50	4	1 ¹ / ₂	10
3	12.60	30.00	4	1 ¹ / ₂	10
3 ¹ / ₁₆	13.10	31.50	4 ¹ / ₂	1 ³ / ₄	11
3 ¹ / ₈	13.60	33.25	4 ¹ / ₂	1 ³ / ₄	11
3 ³ / ₁₆	14.10	35.25	4 ¹ / ₂	1 ³ / ₄	11
3 ¹ / ₄	14.60	37.50	4 ¹ / ₂	1 ³ / ₄	11
3 ⁵ / ₁₆	15.10	40.00	4 ¹ / ₂	1 ³ / ₄	11
3 ³ / ₈	15.60	42.50	4 ¹ / ₂	1 ³ / ₄	11
3 ⁷ / ₁₆	16.10	45.25	4 ¹ / ₂	1 ³ / ₄	11
3 ¹ / ₂	16.60	48.00	4 ¹ / ₂	1 ³ / ₄	11
3 ⁹ / ₁₆	17.20	50.75	5	2	12
3 ⁵ / ₈	17.80	53.50	5	2	12
3 ¹¹ / ₁₆	18.40	56.50	5	2	12
3 ³ / ₄	19.00	59.50	5	2	12
3 ¹³ / ₁₆	19.60	62.75	5	2	12
3 ⁷ / ₈	20.20	66.00	5	2	12
3 ¹⁵ / ₁₆	20.80	69.25	5	2	12
4	21.40	72.50	5	2	12
4 ¹ / ₈	22.90	79.00	5 ¹ / ₂	2 ¹ / ₄	13
4 ¹ / ₄	24.40	85.50	5 ¹ / ₂	2 ¹ / ₄	13
4 ³ / ₈	25.90	92.00	5 ¹ / ₂	2 ¹ / ₄	13
4 ¹ / ₂	27.40	98.50	5 ¹ / ₂	2 ¹ / ₄	13
4 ⁵ / ₈	29.30	105.00	6	2 ¹ / ₂	14
4 ³ / ₄	31.20	111.50	6	2 ¹ / ₂	14
4 ⁷ / ₈	33.10	118.00	6	2 ¹ / ₂	14
5	35.00	125.00	6	2 ¹ / ₂	14
5 ¹ / ₈	37.40	132.50	6	2 ¹ / ₂	14
5 ¹ / ₄	39.80	140.00	6	2 ¹ / ₂	14
5 ³ / ₈	42.20	147.50	6	2 ¹ / ₂	14
5 ¹ / ₂	44.60	155.00	6	2 ¹ / ₂	14
5 ⁵ / ₈	47.60	163.75	6 ¹ / ₂	2 ³ / ₄	15
5 ³ / ₄	50.60	172.50	6 ¹ / ₂	2 ³ / ₄	15
5 ⁷ / ₈	53.60	181.25	6 ¹ / ₂	2 ³ / ₄	15
6	56.60	190.00	6 ¹ / ₂	2 ³ / ₄	15

All tools cataloged are made to standard commercial tolerances.
For special reamers, see page 248.

Rose Shell Reamers

No. 2220



These reamers are for reaming cored holes, etc. The cutting is done at the point. The lands are slightly tapered back from the point to eliminate friction.

All sizes and dimensions not listed are special and subject to special prices.

For shell reamer arbors, see page 180.

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
$\frac{1}{2}$	\$1.70	\$3.25	2	$\frac{1}{4}$	3
$\frac{17}{32}$	1.80	3.40	2	$\frac{1}{4}$	3
$\frac{9}{16}$	1.80	3.40	2	$\frac{1}{4}$	3
$\frac{19}{32}$	1.90	3.55	2	$\frac{1}{4}$	3
$\frac{5}{8}$	1.90	3.55	2	$\frac{1}{4}$	3
$\frac{21}{32}$	2.00	3.70	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{11}{16}$	2.00	3.70	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{23}{32}$	2.10	3.85	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{3}{4}$	2.10	3.85	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{25}{32}$	2.20	4.00	$2\frac{1}{4}$	$\frac{3}{8}$	4
$\frac{13}{16}$	2.20	4.00	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{27}{32}$	2.30	4.25	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{7}{8}$	2.30	4.25	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{29}{32}$	2.40	4.50	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{15}{16}$	2.40	4.50	$2\frac{1}{2}$	$\frac{1}{2}$	5
$\frac{31}{32}$	2.50	4.75	$2\frac{1}{2}$	$\frac{1}{2}$	5
1	2.50	4.75	$2\frac{1}{2}$	$\frac{1}{2}$	5
$1\frac{1}{32}$	2.70	5.00	$2\frac{1}{2}$	$\frac{1}{2}$	5
$1\frac{1}{16}$	2.70	5.00	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{3}{32}$	2.90	5.25	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{1}{8}$	2.90	5.25	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{5}{32}$	3.10	5.50	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{3}{16}$	3.10	5.50	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{7}{32}$	3.30	5.75	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{1}{4}$	3.30	5.75	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{9}{32}$	3.55	6.00	$2\frac{3}{4}$	$\frac{5}{8}$	6
$1\frac{5}{16}$	3.55	6.00	3	$\frac{3}{4}$	7

Continued on following page



Rose Shell Reamers

No. 2220

(Continued)

Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
1 11/32	\$3.80	\$6.50	3	3/4	7
1 3/8	3.80	6.50	3	3/4	7
1 13/32	4.05	7.00	3	3/4	7
1 7/16	4.05	7.00	3	3/4	7
1 15/32	4.30	7.50	3	3/4	7
1 1/2	4.30	7.50	3	3/4	7
1 17/32	4.55	8.25	3	3/4	7
1 9/16	4.55	8.25	3	3/4	7
1 19/32	4.80	9.00	3	3/4	7
1 5/8	4.80	9.00	3	3/4	7
1 21/32	5.10	9.75	3	3/4	7
1 11/16	5.10	9.75	3 1/2	1	8
1 23/32	5.40	10.50	3 1/2	1	8
1 3/4	5.40	10.50	3 1/2	1	8
1 25/32	5.70	11.25	3 1/2	1	8
1 13/16	5.70	11.25	3 1/2	1	8
1 27/32	6.00	12.00	3 1/2	1	8
1 7/8	6.00	12.00	3 1/2	1	8
1 29/32	6.30	12.75	3 1/2	1	8
1 15/16	6.30	12.75	3 1/2	1	8
1 31/32	6.60	13.50	3 1/2	1	8
2	6.60	13.50	3 1/2	1	8
2 1/16	6.95	14.25	3 3/4	1 1/4	9
2 1/8	7.30	15.00	3 3/4	1 1/4	9
2 3/16	7.65	15.75	3 3/4	1 1/4	9
2 1/4	8.00	16.50	3 3/4	1 1/4	9
2 5/16	8.35	17.25	3 3/4	1 1/4	9
2 3/8	8.70	18.00	3 3/4	1 1/4	9
2 7/16	9.05	18.75	3 3/4	1 1/4	9
2 1/2	9.40	19.50	3 3/4	1 1/4	9
2 9/16	9.80	20.50	4	1 1/2	10
2 5/8	10.20	21.75	4	1 1/2	10
2 11/16	10.60	23.00	4	1 1/2	10
2 3/4	11.00	24.25	4	1 1/2	10
2 13/16	11.40	25.50	4	1 1/2	10

Continued on following page

Rose Shell Reamers

No. 2220

(Concluded)

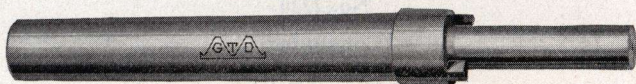
Sizes and Prices

Diam. Inches	Price Each		Length Overall Inches	Diam. Hole Large End Inches	Fitting Arbor Number
	Carbon Steel	High Speed Steel			
2 7/8	\$11.80	\$27.00	4	1 1/2	10
2 15/16	12.20	28.50	4	1 1/2	10
3	12.60	30.00	4	1 1/2	10
3 1/16	13.10	31.50	4 1/2	1 3/4	11
3 1/8	13.60	33.25	4 1/2	1 3/4	11
3 3/16	14.10	35.25	4 1/2	1 3/4	11
3 1/4	14.60	37.50	4 1/2	1 3/4	11
3 5/16	15.10	40.00	4 1/2	1 3/4	11
3 3/8	15.60	42.50	4 1/2	1 3/4	11
3 7/16	16.10	45.25	4 1/2	1 3/4	11
3 1/2	16.60	48.00	4 1/2	1 3/4	11
3 9/16	17.20	50.75	5	2	12
3 5/8	17.80	53.50	5	2	12
3 11/16	18.40	56.50	5	2	12
3 3/4	19.00	59.50	5	2	12
3 13/16	19.60	62.75	5	2	12
3 7/8	20.20	66.00	5	2	12
3 15/16	20.80	69.25	5	2	12
4	21.40	72.50	5	2	12
4 1/8	22.90	79.00	5 1/2	2 1/4	13
4 1/4	24.40	85.50	5 1/2	2 1/4	13
4 3/8	25.90	92.00	5 1/2	2 1/4	13
4 1/2	27.40	98.50	5 1/2	2 1/4	13
4 5/8	29.30	105.00	6	2 1/2	14
4 3/4	31.20	111.50	6	2 1/2	14
4 7/8	33.10	118.00	6	2 1/2	14
5	35.00	125.00	6	2 1/2	14
5 1/8	37.40	132.50	6	2 1/2	14
5 1/4	39.80	140.00	6	2 1/2	14
5 3/8	42.20	147.50	6	2 1/2	14
5 1/2	44.60	155.00	6	2 1/2	14
5 5/8	47.60	163.75	6 1/2	2 3/4	15
5 3/4	50.60	172.50	6 1/2	2 3/4	15
5 7/8	53.60	181.25	6 1/2	2 3/4	15
6	56.60	190.00	6 1/2	2 3/4	15

All tools catalogd are made to standard commercial tolerances.
For special reamers, see page 248,



Arbors for Shell Reamers



No. 486 (Straight Shank)



No. 487 (Morse Taper Shank)

These arbors are designed to fit shell reamers listed on pages 174 to 179, and 197 to 200 inclusive.

Specify style of shank wanted.

All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

No.	Price Each		Fitting Size Reamer	Length Overall Inches	No. of Morse Taper Shank
	Straight Shank	M. T. Shank			
3	\$2.40	\$2.90	$\frac{1}{2}$ — $\frac{5}{8}$	8	1
4	2.70	3.25	$2\frac{1}{32}$ — $2\frac{5}{32}$	9	2
5	3.00	3.60	$1\frac{3}{16}$ — $1\frac{1}{8}$	$9\frac{1}{2}$	2
6	3.30	3.95	$1\frac{1}{16}$ — $1\frac{9}{32}$	10	3
7	3.60	4.30	$1\frac{5}{16}$ — $1\frac{21}{32}$	11	3
8	4.00	4.80	$1\frac{11}{16}$ —2	12	4
9	4.50	5.40	$2\frac{1}{16}$ — $2\frac{1}{2}$	13	4
10	5.25	6.30	$2\frac{9}{16}$ —3	14	5
11	7.50	9.00	$3\frac{1}{16}$ — $3\frac{1}{2}$	15	5
12	10.50	12.60	$3\frac{9}{16}$ —4	16	5
13	13.50	16.20	$4\frac{1}{8}$ — $4\frac{1}{2}$	17	5
14	18.00	21.60	$4\frac{5}{8}$ — $5\frac{1}{2}$	18	5
15	22.00	26.40	$5\frac{5}{8}$ —6	19	6

Countersinks

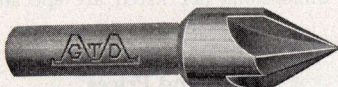
For Bolts (54°) and Screws (82°)



Stocked in three styles of shank, Bit Brace, $\frac{1}{2}$ " Round and $\frac{41}{64}$ " Round. Order by number.

Number			Price Each	Size Cut	
Bit Brace Shank	$\frac{1}{2}$ " Round Shank	$\frac{41}{64}$ " Round Shank		Diameter Inches	Angle Degrees
501	502	503	\$0.50	$\frac{5}{8}$ "	54°
504	505	506	.50	$\frac{5}{8}$ "	82°
507	508	509	.75	$\frac{3}{4}$ "	54°
511	512	513	.75	$\frac{3}{4}$ "	82°

Center Reamers



These reamers are regularly furnished with sixty degree inclusive angle.

Carbon Steel Center Reamers having seventy-two or eighty-two degree inclusive angle will be furnished at regular list and discount.

High Speed Steel Center Reamers are regularly furnished with sixty or seventy-two degrees inclusive angle.

All sizes, dimensions and styles not listed are special and subject to special prices.

Sizes and Prices

No.	Size Cut Inches	Price		Diameter Shanks Inches
		Carbon Steel	High Speed Steel	
535	$\frac{1}{4}$ "	\$0.45	\$1.00	$\frac{3}{16}$ "
536	$\frac{3}{8}$ "	.50	1.50	$\frac{1}{4}$ "
537	$\frac{1}{2}$ "	.60	2.00	$\frac{5}{16}$ "
538	$\frac{5}{8}$ "	.70	2.75	$\frac{3}{8}$ "
539	$\frac{3}{4}$ "	.85	3.50	$\frac{1}{2}$ "



Morse Taper Reamers

With Square Shank



Roughing Reamer No. 451



Finishing Reamer No. 455

These reamers are designed for use in reaming out Morse Standard Taper Sockets.

All sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Taper No.	Price Each		Diam. Small End Inches	Diam. Large End Inches	Length Overall Inches	Length of Flute Inches	Taper per ft. Inches
	Finish- ing	Rough- ing					
0	\$1.60	\$1.90	.250	.367	3¼	2¼	0.625
1	2.00	2.40	.367	.517	5½	3	0.600
2	2.60	3.10	.569	.745	7	3½	0.602
3	3.40	4.10	.775	.988	8	4¼	0.602
4	4.20	5.05	1.017	1.289	9	5¼	0.623
5	6.60	7.90	1.471	1.799	10	6¼	0.630
6	12.00	14.40	2.112	2.555	12	8½	0.626
7	35.00	42.00	2.746	3.371	16	12	0.625

Brown & Sharpe Taper Reamers

With Square Shank



Roughing Reamer No. 452



Finishing Reamer No. 456

These reamers are designed for use in reaming out Brown & Sharpe Standard Taper Sockets.

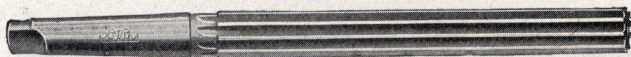
All sizes, dimensions and styles not listed are special and subject to special prices.

Sizes and Prices

Number of Taper	Price Each		Length Overall Inches	Length of Flute Inches
	Finishing	Roughing		
1	\$1.75	\$2.10	4 $\frac{3}{4}$	2 $\frac{7}{8}$
2	2.00	2.40	5 $\frac{1}{8}$	3 $\frac{1}{8}$
3	2.25	2.70	5 $\frac{1}{2}$	3 $\frac{3}{8}$
4	2.50	3.00	5 $\frac{7}{8}$	3 $\frac{11}{16}$
5	3.00	3.60	6 $\frac{3}{8}$	4
6	3.25	3.90	6 $\frac{7}{8}$	4 $\frac{3}{8}$
7	3.50	4.20	7 $\frac{1}{2}$	4 $\frac{7}{8}$
8	3.75	4.50	8 $\frac{1}{8}$	5 $\frac{1}{2}$
9	4.00	4.80	8 $\frac{7}{8}$	6 $\frac{1}{8}$
10	5.00	6.00	9 $\frac{3}{4}$	6 $\frac{7}{8}$
11	6.00	7.20	10 $\frac{5}{8}$	7 $\frac{5}{8}$
12	8.00	9.60	11 $\frac{3}{8}$	8 $\frac{1}{4}$
13	10.00	12.00	12	8 $\frac{3}{4}$
14	12.00	14.40	12 $\frac{1}{2}$	9 $\frac{1}{4}$
15	14.00	16.80	13 $\frac{1}{8}$	9 $\frac{3}{4}$
16	16.00	19.20	13 $\frac{1}{2}$	10 $\frac{1}{4}$
17	19.00	22.80	13 $\frac{3}{4}$	10 $\frac{3}{4}$
18	22.00	26.40	14 $\frac{1}{4}$	11 $\frac{1}{4}$

Locomotive Taper Reamers

With Morse Taper Shank



No. 430

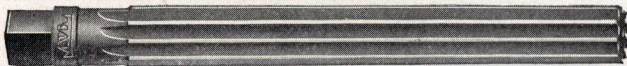
Locomotive taper reamers are regularly furnished with a taper of $\frac{1}{16}$ " per foot. All sizes, dimensions and taper per foot not listed are special and subject to special prices. Morse Taper shank locomotive taper reamers with spiral flutes are special and subject to special prices.

Sizes and Prices

Diam. Inches Small End	Price Each		Length Overall Inches	Length of Flute Inches	No. of Morse Taper Shank
	Carbon Steel	High Speed Steel			
$\frac{1}{4}$	\$3.10	\$6.00	$7\frac{5}{16}$	4	1
$\frac{9}{32}$	3.10	6.25	$7\frac{5}{16}$	4	1
$\frac{5}{16}$	3.15	6.50	$7\frac{5}{16}$	4	1
$\frac{11}{32}$	3.15	6.75	$7\frac{5}{16}$	4	1
$\frac{3}{8}$	3.20	7.00	$8\frac{5}{16}$	5	1
$\frac{13}{32}$	3.25	7.25	$8\frac{5}{16}$	5	1
$\frac{7}{16}$	3.30	7.50	$9\frac{5}{16}$	6	1
$\frac{15}{32}$	3.45	7.75	$9\frac{5}{16}$	6	1
$\frac{1}{2}$	3.50	8.00	$10\frac{5}{16}$	7	1
$\frac{9}{16}$	3.50	8.75	$11\frac{5}{16}$	8	1
$\frac{5}{8}$	4.00	9.50	$11\frac{13}{16}$	8	2
$\frac{11}{16}$	4.50	10.25	$11\frac{13}{16}$	8	2
$\frac{3}{4}$	4.90	11.00	$15\frac{13}{16}$	12	2
$\frac{13}{16}$	5.30	12.00	$15\frac{13}{16}$	12	2
$\frac{7}{8}$	5.70	13.00	$15\frac{13}{16}$	12	2
$\frac{15}{16}$	6.05	14.00	$16\frac{1}{2}$	12	3
1	6.40	15.50	$16\frac{1}{2}$	12	3
$\frac{11}{16}$	6.60	17.00	$20\frac{1}{2}$	16	3
$\frac{1}{8}$	6.80	18.50	$20\frac{1}{2}$	16	3
$\frac{13}{16}$	7.25	20.00	$20\frac{1}{2}$	16	3
$\frac{1}{4}$	7.70	22.00	$21\frac{1}{2}$	16	4
$\frac{5}{16}$	8.35	24.00	$23\frac{1}{2}$	18	4
$\frac{13}{8}$	8.80	26.00	$23\frac{1}{2}$	18	4
$\frac{7}{16}$	9.35	28.00	$23\frac{1}{2}$	18	4
$\frac{1}{2}$	9.90	30.00	$23\frac{1}{2}$	18	4
$\frac{9}{16}$	10.55	32.50	$25\frac{1}{2}$	20	4
$\frac{5}{8}$	11.20	35.00	$25\frac{1}{2}$	20	4
$\frac{11}{16}$	11.95	38.00	$25\frac{1}{2}$	20	4
$\frac{3}{4}$	12.75	41.00	$26\frac{3}{4}$	20	5
$\frac{13}{16}$	13.65	44.00	$26\frac{3}{4}$	20	5
$\frac{7}{8}$	14.60	47.00	$26\frac{3}{4}$	20	5
$\frac{15}{16}$	15.70	51.00	$26\frac{3}{4}$	20	5
2	16.80	55.00	$26\frac{3}{4}$	20	5

Locomotive Taper Reamers

With Square Shank



No. 431

Locomotive Taper Reamers are regularly furnished with taper of $\frac{1}{16}$ " per foot. All sizes, dimensions and tapers per foot not listed are special and subject to special prices. Square Shank locomotive taper reamers with spiral flutes are special and subject to special prices.

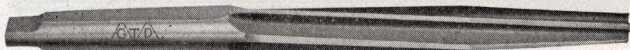
Sizes and Prices

Diameter Inches Small End	Price Each		Length Overall Inches	Length of Flute Inches
	Carbon Steel	High Speed Steel		
$\frac{1}{4}$	\$2.20	\$5.00	$5\frac{5}{16}$	4
$\frac{9}{32}$	2.20	5.20	$5\frac{5}{16}$	4
$\frac{5}{16}$	2.25	5.40	$5\frac{5}{16}$	4
$\frac{11}{32}$	2.25	5.60	$5\frac{5}{16}$	4
$\frac{3}{8}$	2.30	5.80	$6\frac{5}{16}$	5
$\frac{13}{32}$	2.40	6.00	$6\frac{5}{16}$	5
$\frac{7}{16}$	2.55	6.20	$7\frac{5}{16}$	6
$\frac{15}{32}$	2.70	6.40	$7\frac{5}{16}$	6
$\frac{1}{2}$	3.00	6.60	$8\frac{5}{8}$	7
$\frac{9}{16}$	3.20	7.10	$9\frac{7}{8}$	8
$\frac{5}{8}$	3.50	7.60	$9\frac{7}{8}$	8
$\frac{11}{16}$	3.80	8.25	$9\frac{7}{8}$	8
$\frac{3}{4}$	4.10	9.00	$13\frac{7}{8}$	12
$\frac{13}{16}$	4.50	10.00	$14\frac{1}{4}$	12
$\frac{7}{8}$	4.80	11.00	$14\frac{1}{4}$	12
$\frac{15}{16}$	5.10	12.00	$14\frac{1}{4}$	12
1	5.40	13.00	$14\frac{1}{4}$	12
$1\frac{1}{16}$	5.70	14.50	$18\frac{1}{4}$	16
$1\frac{1}{8}$	6.20	16.00	$18\frac{1}{4}$	16
$1\frac{3}{16}$	6.60	17.50	$18\frac{1}{4}$	16
$1\frac{1}{4}$	7.00	19.00	$18\frac{1}{4}$	16
$1\frac{5}{16}$	7.60	20.75	$20\frac{1}{2}$	18
$1\frac{3}{8}$	8.00	22.50	$20\frac{1}{2}$	18
$1\frac{7}{16}$	8.50	24.50	$20\frac{1}{2}$	18
$1\frac{1}{2}$	9.00	26.50	$20\frac{1}{2}$	18
$1\frac{9}{16}$	9.60	29.00	$22\frac{1}{2}$	20
$1\frac{5}{8}$	10.20	31.50	$22\frac{1}{2}$	20
$1\frac{11}{16}$	10.85	34.00	$22\frac{1}{2}$	20
$1\frac{3}{4}$	11.60	36.50	$22\frac{1}{2}$	20
$1\frac{13}{16}$	12.40	39.00	$22\frac{1}{2}$	20
$1\frac{7}{8}$	14.00	42.00	$22\frac{1}{2}$	20
$1\frac{15}{16}$	15.00	46.00	$22\frac{1}{2}$	20
2	16.00	50.00	$22\frac{1}{2}$	20



Taper Bridge Reamers

With Spiral and Straight Flutes



Morse Taper Shank No. 407



Square Shank No. 406

Taper Bridge Reamers are used for reaming the rivet and bolt holes in structural iron work in buildings, bridges and ship frames, as well as in boiler work. They are regularly furnished with Morse taper shanks. Owing to popular demand these shanks are flatted to fit Use-em-up sockets as well as the standard Morse taper sockets.

The fluted section of these reamers is tapered abruptly at the point to facilitate entering holes which are out of alignment. The greater part of this section is made straight, however, and in diameters varying from $\frac{1}{4}$ to $1\frac{1}{2}$ inches to accommodate different sizes of rivet.

These reamers are superior to the ordinary spiral fluted reamer in that their slight right hand spiral flute is just sufficient to enable the reamer to feed itself into the work, producing a smooth, steady, shearing cut. This spiral, while permitting of a fairly rapid cut is not so pronounced as to allow the reamer to draw itself from the holder. GTD Bridge Reamers have repeatedly demonstrated their superiority for this purpose both in the quality and speed of their work and in their exceptionally long life.

We also manufacture straight flute bridge reamers with square shanks as listed on opposite page.

All sizes, dimensions and styles not listed are special and subject to special prices.



Taper Bridge Reamers

No. 407

(With Spiral Flutes)—Morse Taper Shank

Full Diam. Inches	Diam. at Point Inches	Price Each		Length Overall Inches	Length of Flute	No. of Taper
		Carbon Steel	High Speed Steel			
1/4	5/32	\$2.75	\$3.00	6 3/8	3 3/8	1
9/32	11/64	2.80	3.25	6 3/4	3 3/4	1
5/16	3/16	2.90	3.25	6 3/4	3 3/4	1
11/32	13/64	2.95	3.50	7 1/4	4	1
3/8	7/32	3.00	3.50	7 1/4	4	1
13/32	15/64	3.05	3.75	8 1/4	4 3/8	2
7/16	1/4	3.10	3.75	8 1/4	4 3/8	2
15/32	9/32	3.20	4.00	9	5 3/8	2
1 1/2	5/16	3.30	4.00	9	5 3/8	2
9/16	3/8	3.50	4.25	9	5 3/8	2
5/8	3/8	3.65	4.50	10	6 1/8	2
11/16	3/8	3.85	4.75	11 3/4	7 1/8	3
3/4	7/16	4.00	5.00	12	7 3/8	3
13/16	1/2	4.20	5.30	12	7 3/8	3
7/8	9/16	4.50	5.70	12	7 3/8	3
15/16	5/8	4.80	6.00	12	7 3/8	3
1	11/16	5.10	6.50	12	7 3/8	3
1 1/16	3/4	5.40	7.00	12	7 3/8	3
1 1/8	13/16	5.70	7.50	12	7 3/8	3
1 1/16	7/8	6.00	8.00	12	7 3/8	3
1 1/4	15/16	6.60	8.75	13	7 3/8	4
1 5/16	1	7.20	9.50	13	7 3/8	4
1 3/8	1 1/16	7.80	10.50	13	7 3/8	4
1 7/16	1 1/8	8.40	12.00	13	7 3/8	4
1 1/2	1 3/16	9.60	14.00	13	7 3/8	4

Taper Bridge Reamers

With Square Shank—No. 406

Full Diameter Inches	Diam. At Point Inches	Price Each		Length Overall Inches	Length of Flute Inches
		Carbon Steel	High Speed Steel		
1/4	5/32	\$2.30	\$2.50	4 1/4	3 3/8
9/32	11/64	2.35	2.70	4 3/4	3 3/4
5/16	3/16	2.40	2.70	4 3/4	3 3/4
11/32	13/64	2.45	2.90	5 1/2	4
3/8	7/32	2.50	2.90	5 1/2	4
13/32	15/64	2.55	3.10	6 1/2	4 3/8
7/16	1/4	2.60	3.10	6 1/2	4 3/8
15/32	9/32	2.65	3.30	8 3/8	5 3/8
1 1/2	5/16	2.75	3.30	8 3/8	5 3/8
9/16	3/8	2.90	3.50	8 3/8	5 3/8
5/8	3/8	3.05	3.70	9 1/8	6 1/8
11/16	3/8	3.20	3.90	10 1/8	7 1/8
3/4	7/16	3.35	4.10	10 1/2	7 3/8
13/16	1/2	3.50	4.40	10 1/2	7 3/8
7/8	9/16	3.75	4.70	10 5/8	7 3/8
15/16	5/8	4.00	5.00	10 5/8	7 3/8
1	11/16	4.25	5.30	10 5/8	7 3/8
1 1/16	3/4	4.50	5.85	10 5/8	7 3/8
1 1/8	13/16	4.75	6.40	10 5/8	7 3/8
1 1/16	7/8	5.00	6.95	10 5/8	7 3/8
1 1/4	15/16	5.50	7.50	10 5/8	7 3/8
1 5/16	1	6.00	8.25	10 5/8	7 3/8
1 3/8	1 1/16	6.50	9.00	10 5/8	7 3/8
1 7/16	1 1/8	7.00	10.00	10 5/8	7 3/8
1 1/2	1 3/16	8.00	11.00	10 5/8	7 3/8



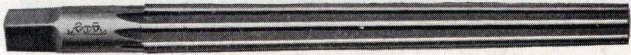
Taper Pin Reamers

Straight or Spiral Flutes

Taper $\frac{1}{4}$ inch per Foot



No. 405



No. 404

All sizes, dimensions and styles not listed are special and subject to special prices.

Sizes and Prices

Number	Price Each		Diameter Large End Inches	Diameter Small End Inches	Length Overall Inches	Length of Flute Inches
	Str. Flutes	Spiral Flutes				
000	\$1.50	....	.130	.101	2	1 $\frac{3}{8}$
00	1.35	....	.145	.114	2 $\frac{1}{4}$	1 $\frac{1}{2}$
0	1.00	....	.161	.127	2 $\frac{3}{8}$	1 $\frac{5}{8}$
1	1.00	\$1.20	.182	.146	2 $\frac{1}{2}$	1 $\frac{3}{4}$
2	1.25	1.50	.204	.162	3	2
3	1.50	1.80	.230	.183	3 $\frac{1}{2}$	2 $\frac{1}{4}$
4	1.75	2.10	.260	.208	4	2 $\frac{1}{2}$
5	2.00	2.40	.303	.240	4 $\frac{1}{2}$	3
6	2.25	2.70	.355	.279	5	3 $\frac{5}{8}$
7	2.50	3.00	.425	.331	6	4 $\frac{1}{2}$
8	3.00	3.60	.507	.398	6 $\frac{3}{4}$	5 $\frac{1}{4}$
9	3.50	4.20	.610	.482	8	6 $\frac{1}{8}$
10	4.50	5.40	.727	.581	9	7
11	....	7.20	.878	.706	11 $\frac{1}{4}$	8 $\frac{1}{4}$
12	....	9.00	1.155	.842	13 $\frac{3}{8}$	10
13	....	10.80	1.259	1.009	16	12
14	....	13.20	1.542	1.250	18 $\frac{1}{4}$	14



Taper Pin Reamers

In Hardwood Cases



- | | | |
|-----------------|--|---------------|
| No. 1420 | 6 Sizes Nos. 0, 1, 2, 3, 4, 5 in hardwood case. | |
| | Straight Fluted..... | \$9.50 |
| | Spiral Fluted..... | 11.25 |
| No. 1421 | 11 Sizes Nos. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 in hardwood case. | |
| | Straight Fluted..... | 26.50 |
| | Spiral Fluted..... | 30.00 |

In Leather Roll for Automobile Kits.



- | | | |
|-----------------|---|---------------|
| No. 1423 | 6 Sizes Nos. 0, 1, 2, 3, 4 and 5. Straight Fluted | \$9.50 |
| | Spiral Fluted..... | 11.25 |
- Separate Reamers listed on opposite page.



Spiral Fluted Taper Reamers



No. 460 (Bit Brace)



No. 465 (Square Shank)

Each reamer is approximately $\frac{1}{32}$ " larger at the largest cutting diameter than the nominal size. The point of each reamer will enter the hole reamed by next smaller size. Specify style of shank.

Sizes and Prices

Nominal Size Inches	Price Each	Nominal Size Inches	Price Each
$\frac{1}{8}$	\$0.60	$\frac{7}{8}$	\$1.75
$\frac{3}{16}$	.60	$\frac{15}{16}$	2.00
$\frac{1}{4}$	.60	1	2.25
$\frac{5}{16}$	.60	$1\frac{1}{16}$	2.50
$\frac{3}{8}$	.65	$1\frac{1}{8}$	2.85
$\frac{7}{16}$	.70	$1\frac{3}{16}$	3.20
$\frac{1}{2}$	.75	$1\frac{1}{4}$	3.55
$\frac{9}{16}$	.80	$1\frac{5}{16}$	3.90
$\frac{5}{8}$	.95	$1\frac{3}{8}$	4.25
$1\frac{1}{16}$	1.10	$1\frac{7}{16}$	4.60
$\frac{3}{4}$	1.25	$1\frac{1}{2}$	5.00
$1\frac{1}{8}$	1.50		

Taper Reamers in Sets

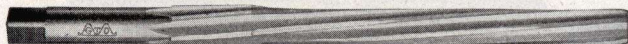


No. 705	5 Sizes	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	\$4.00
No. 709	9 Sizes	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $1\frac{1}{16}$, $\frac{3}{4}$	8.25

Bit Brace Shanks furnished unless otherwise specified.

Bushing Reamers for Ford Cars

These reamers are the same as shown in the No. 2501 Screw Plates described on page 55.



Spindle Body (Part No. 2713) and Spindle Arm Bushing (Part No. 2714) Reamer No. 1424

A 2-in-1 reamer for front axle bushings. The 5-inch section reams the spindle body bushings in perfect alignment at one operation.

The 1-inch section is for use in the spindle arm bushing.

Price each \$2.50



Piston Pin Bushing (Part No. 3022½) Reamer No. 1425

Used for reaming through both the piston pin bushings for perfect alignment of piston pins.

Price each \$1.75

Repairman's Taper Reamers



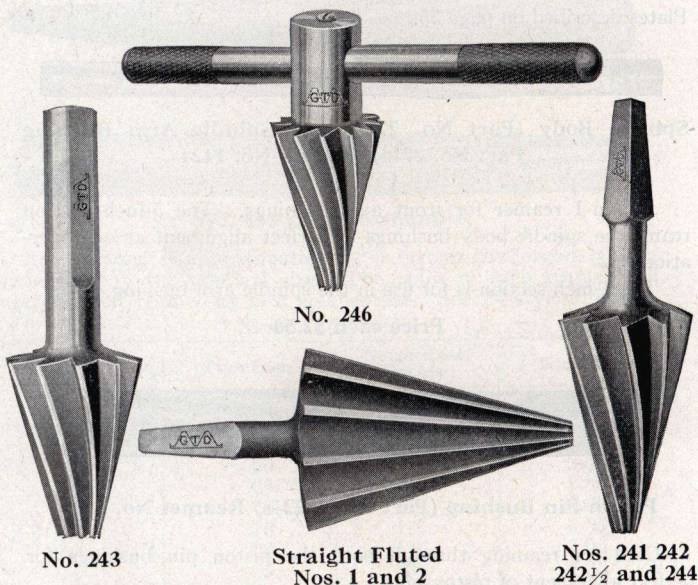
Automobile and bicycle repairmen, blacksmiths, electricians, machinists, plumbers, carpenters, carriage builders, etc., all find this Reamer useful for enlarging holes in any material.

No.	Diameter		Length		Wt.	Price Each
	At Large End	At Point	Over-all	Reamer Part		
5	½"	⅛"	6 ½"	4 ½"	2 oz.	\$0.80
6	1"	⅜"	6 ½"	4 ½"	5 oz.	1.60



Burring Reamers

With Spiral and Straight Flutes



These Burring Reamers are made of finest steel and designed especially for removing burrs, caused by cutting pipe.

They are also extensively used for countersinking.

Great care is taken in grinding these tools to adapt them for use in a variety of materials.

Spiral Fluted Burring Reamers

Order by this No.	Price Each	Style of Shank	Capacity Pipe Inches
241	\$1.00	Bit Brace	$\frac{1}{8}$ to $\frac{1}{2}$
242	1.25	Bit Brace	$\frac{1}{8}$ to 1
242 $\frac{1}{2}$	1.50	Bit Brace	$\frac{1}{4}$ to $1\frac{1}{4}$
243	1.50	$\frac{1}{2}$ Round	$\frac{1}{4}$ to $1\frac{1}{4}$
244	3.00	Bit Brace	$\frac{1}{4}$ to 2
246	4.00	T Handle	$\frac{1}{4}$ to 2

Straight Flute Burring Reamers

1	\$1.50	Bit Brace	$\frac{1}{4}$ to $1\frac{1}{4}$
2	3.00	Bit Brace	$\frac{1}{4}$ to 2

Please order by number.



Metric Expansion Hand Reamers

No. 415



Sizes and Prices

Diameter Millimeters	Each	Length Overall mm.	Length of Flute mm.
6	\$3.00	102	38.1
7	3.05	102	38.1
8	3.15	102	38.1
9	3.20	127	44.4
10	3.25	127	44.4
11	3.30	127	44.4
12	3.40	152	57.1
13	3.50	152	57.1
14	3.65	152	57.1
15	3.80	152	57.1
16	4.20	152	57.1
17	4.40	178	66.7
18	4.60	178	66.7
19	4.80	178	66.7
20	5.25	178	66.7
21	5.50	178	66.7
22	5.75	203	79.4
23	6.00	203	79.4
24	6.50	203	79.4
25	6.75	203	79.4
26	7.00	229	90.5
27	7.25	229	90.5
28	7.75	229	90.5
29	8.00	229	90.5
30	8.30	229	90.5
31	8.90	229	90.5
32	9.20	254	108
33	9.50	279	133
34	10.00	279	133
35	11.00	279	140
36	11.50	279	140
37	12.00	279	146
38	12.50	279	152
39	13.00	292	152
40	13.25	292	152
41	13.50	292	152
42	13.75	295	152
43	14.25	295	152
44	14.50	301	152
45	14.75	301	152
46	15.00	306	152
47	15.50	311	152
48	15.75	311	152
49	16.00	314	152
50	16.25	319	152



Metric Hand Reamers

No. 400

Hand reamers with threaded ends or spiral flutes and all sizes and dimensions not listed are special and subject to special prices.

Sizes and Prices

Diameter Millimeters	Price Each		Length Overall Millimeters	Length of Flute Millimeters
	Carbon Steel	High Speed Steel		
3.	\$1.00	\$3.00	76	38
3.5	1.10	3.25	79	39.5
4	1.10	3.25	82	41
4.5	1.20	3.25	89	44.5
5	1.25	3.50	92	46
5.5	1.30	3.50	95	47.5
6	1.40	3.50	102	51
6.5	1.40	3.75	105	52.5
7	1.45	3.75	108	54
7.5	1.50	3.75	112	56
8	1.50	4.25	117	58.5
8.5	1.55	4.25	121	60.5
9	1.60	4.25	124	62
9.5	1.60	4.25	127	63.5
10	1.70	4.75	133	66.5
10.5	1.70	4.75	136	68
11	1.75	4.75	140	70
11.5	1.85	5.25	143	71.5
12	1.85	5.25	149	74.5
12.5	1.90	5.25	152	76
13	1.95	5.75	155	77.5
13.5	1.95	5.75	162	81
14	2.00	5.75	165	82.5
14.5	2.10	6.25	168	84
15	2.10	6.25	171	85.5
15.5	2.20	6.25	178	89
16	2.20	6.75	182	91

Continued on following page



Metric Hand Reamers

No. 400

(Continued)

Sizes and Prices

Diameter Milli- meters	Price Each		Length Overall Millimeters	Length of Flute Millimeters
	Carbon Steel	High Speed Steel		
16.5	\$2.30	\$6.75	187	93.5
17	2.40	6.75	190	95
17.5	2.40	7.25	200	100
18	2.50	7.25	206	103
18.5	2.60	7.25	209	104.5
19	2.60	7.25	213	106.5
19.5	2.70	7.75	222	111
20	2.75	7.75	226	113
20.5	2.80	7.75	230	115
21	2.90	8.50	233	116.5
21.5	3.00	8.50	241	120.5
22	3.10	8.50	246	123
22.5	3.20	9.50	251	125.5
23	3.25	9.50	256	128
23.5	3.35	9.50	260	130
24	3.40	10.50	267	133.5
24.5	3.55	10.50	272	136
25	3.60	10.50	274	138
26	3.80	11.50	281	140.5
27	4.00	12.75	290	145
28	4.25	12.75	295	147.5
29	4.45	14.25	300	150
30	4.60	14.25	306	152
31	4.75	15.75	311	155.5
32	4.90	17.25	314	157
33	5.15	17.25	316	158
34	5.40	18.75	318	159
35	5.60	20.50	323	161.5
36	5.90	20.50	325	162.5
37	6.15	22.25	329	164.5
38	6.40	22.25	330	165
39	6.60	24.00	330	165
40	6.90	25.75	330	165
41	7.20	25.75	330	165

Continued on following page



Metric Hand Reamers

No. 400

(Concluded)

Sizes and Prices

Diameter Millimeters	Price Each		Length Overall Millimeters	Length of Flute Millimeters
	Carbon Steel	High Speed Steel		
42	\$7.40	\$27.50	343	171.5
43	7.60	29.50	343	171.5
44	7.90	29.50	343	171.5
45	8.10	31.50	343	171.5
46	8.40	31.50	343	171.5
47	8.60	33.50	356	178
48	8.90	35.75	356	178
49	9.20	35.75	356	178
50	9.40	38.00	356	178
51	9.70	40.75	368	184
52	10.00	40.75	368	184
53	10.20	43.50	368	184
54	10.40	46.25	368	184
55	10.70	46.25	381	190.5
56	11.00	49.00	381	190.5
57	11.30	49.00	381	190.5
58	11.60	51.75	381	190.5
59	12.00	55.00	381	190.5
60	12.30	55.00	381	190.5
61	12.55	58.25	394	197
62	12.90	61.50	394	197
63	13.30	61.50	394	197
64	13.70	64.75	394	197
65	14.00	64.75	394	197
66	14.30	68.00	406	203
67	14.80	71.25	406	203
68	15.40	71.25	406	203
69	15.80	74.50	406	203
70	16.40	77.75	406	203
71	17.00	77.75	419	209.5
72	17.40	81.00	419	209.5
73	17.80	81.00	419	209.5
74	18.40	84.25	419	209.5
75	19.00	87.50	419	209.5

All tools catalogd are made to standard commercial tolerances.

For special reamers, see page 248.

Metric Fluted Shell Reamers

No. 421

Shell reamers with spiral flutes and all sizes and dimensions not listed are special and subject to special prices.

For shell reamer arbors, see page 180.

Sizes and Prices

Diameter Millimeters	Price Each		Length Overall Millimeters	Diameter Hole Large End Millimeters	Fitting Arbor No.
	Carbon Steel	High Speed Steel			
13	\$1.70	\$3.25	51	6.35	3
14	1.80	3.40	51	6.35	3
15	1.90	3.55	51	6.35	3
16	1.90	3.70	57	6.35	3
17	2.00	3.70	57	9.50	4
18	2.10	3.85	57	9.50	4
19	2.10	3.85	63	9.50	4
20	2.20	4.00	63	9.50	4
21	2.20	4.25	63	12.70	5
22	2.30	4.25	63	12.70	5
23	2.40	4.50	63	12.70	5
24	2.40	4.75	63	12.70	5
25	2.50	4.75	70	12.70	5
26	2.70	5.25	70	12.70	5
27	2.70	5.25	70	15.87	6
28	2.90	5.25	70	15.87	6
29	3.10	5.50	70	15.87	6
30	3.10	5.50	70	15.87	6
31	3.30	5.75	70	15.87	6
32	3.30	6.00	70	15.87	6
33	3.55	6.00	76	19.05	7
34	3.80	6.50	76	19.05	7
35	3.80	7.00	76	19.05	7
36	4.05	7.00	76	19.05	7
37	4.30	7.50	76	19.05	7
38	4.30	7.50	76	19.05	7
39	4.55	8.25	76	19.05	7
40	4.55	9.00	76	19.05	7

Continued on following page



Metric Fluted Shell Reamers

No. 421

(Concluded)

Sizes and Prices

Diameter Millimeters	Price Each		Length Overall Millimeters	Diameter Hole Large End Millimeters	Fitting Arbor No.
	Carbon Steel	High Speed Steel			
41	\$4.80	\$9.00	76	19.05	7
42	5.10	9.75	76	19.05	7
43	5.10	10.50	89	25.40	8
44	5.40	10.50	89	25.40	8
45	5.70	11.25	89	25.40	8
46	5.70	11.25	89	25.40	8
47	6.00	12.00	89	25.40	8
48	6.00	12.75	89	25.40	8
49	6.30	12.75	89	25.40	8
50	6.60	13.50	89	25.40	8
51	6.60	14.25	89	25.40	8
52	6.95	14.25	95	31.75	9
53	6.95	15.00	95	31.75	9
54	7.30	15.75	95	31.75	9
55	7.65	15.75	95	31.75	9
56	7.65	16.50	95	31.75	9
57	8.00	16.50	95	31.75	9
58	8.35	17.25	95	31.75	9
59	8.35	18.00	95	31.75	9
60	8.70	18.00	95	31.75	9
61	8.70	18.75	95	31.75	9
62	9.05	19.50	95	31.75	9
63	9.40	19.50	95	31.75	9
64	9.40	20.50	95	31.75	9
65	9.80	20.50	101.5	38.10	10
66	10.20	21.75	101.5	38.10	10
67	10.20	23.00	101.5	38.10	10
68	10.60	23.00	101.5	38.10	10
69	10.60	24.25	101.5	38.10	10
70	11.00	25.50	101.5	38.10	10
71	11.40	25.50	101.5	38.10	10
72	11.40	27.00	101.5	38.10	10
73	11.80	27.00	101.5	38.10	10
74	12.20	28.50	101.5	38.10	10
75	12.20	30.00	101.5	38.10	10

Metric Rose Shell Reamers

No. 2220

All sizes and dimensions not listed are special and subject to special prices.

For shell reamer arbors, see page 180.

Sizes and Prices

Diam. Milli- meters	Price Each		Length Overall Millimeters	Diam. Hole Large End Millimeters	Fitting Arbor No.
	Carbon Steel	High Speed Steel			
13	\$1.70	\$3.25	51	6.35	3
14	1.80	3.40	51	6.35	3
15	1.90	3.55	51	6.35	3
16	1.90	3.70	51	6.35	3
17	2.00	3.70	57	9.50	4
18	2.10	3.85	57	9.50	4
19	2.10	3.85	57	9.50	4
20	2.20	4.00	57	9.50	4
21	2.20	4.25	63	12.70	5
22	2.30	4.25	63	12.70	5
23	2.40	4.50	63	12.70	5
24	2.40	4.75	63	12.70	5
25	2.50	4.75	63	12.70	5
26	2.70	5.25	63	12.70	5
27	2.70	5.25	70	15.87	6
28	2.90	5.25	70	15.87	6
29	3.10	5.50	70	15.87	6
30	3.10	5.50	70	15.87	6
31	3.30	5.75	70	15.87	6
32	3.30	6.00	70	15.87	6
33	3.55	6.00	76	19.05	7
34	3.80	6.50	76	19.05	7
35	3.80	7.00	76	19.05	7
36	4.05	7.00	76	19.05	7
37	4.30	7.50	76	19.05	7
38	4.30	7.50	76	19.05	7
39	4.55	8.25	76	19.05	7
40	4.55	9.00	76	19.05	7

Continued on following page



Metric Rose Shell Reamers

No. 2220

(Concluded)

Sizes and Prices

Diameter Millimeters	Price Each		Length Overall Millimeters	Diameter Hole Large End Millimeters	Fitting Arbor No.
	Carbon Steel	High Speed Steel			
41	\$4.80	\$9.00	76	19.05	7
42	5.10	9.75	76	19.05	7
43	5.10	10.50	89	25.40	8
44	5.40	10.50	89	25.40	8
45	5.70	11.25	89	25.40	8
46	5.70	11.25	89	25.40	8
47	6.00	12.00	89	25.40	8
48	6.00	12.75	89	25.40	8
49	6.30	12.75	89	25.40	8
50	6.60	13.50	89	25.40	8
51	6.60	14.25	89	25.40	8
52	6.95	14.25	95	31.75	9
53	6.95	15.00	95	31.75	9
54	7.30	15.75	95	31.75	9
55	7.65	15.75	95	31.75	9
56	7.65	16.50	95	31.75	9
57	8.00	16.50	95	31.75	9
58	8.35	17.25	95	31.75	9
59	8.35	18.00	95	31.75	9
60	8.70	18.00	95	31.75	9
61	8.70	18.75	95	31.75	9
62	9.05	19.50	95	31.75	9
63	9.40	19.50	95	31.75	9
64	9.40	20.50	95	31.75	9
65	9.80	20.50	101.5	38.10	10
66	10.20	21.75	101.5	38.10	10
67	10.20	23.00	101.5	38.10	10
68	10.60	23.00	101.5	38.10	10
69	10.60	24.25	101.5	38.10	10
70	11.00	25.50	101.5	38.10	10
71	11.40	25.50	101.5	38.10	10
72	11.40	27.00	101.5	38.10	10
73	11.80	27.00	101.5	38.10	10
74	12.20	28.50	101.5	38.10	10
75	12.20	30.00	101.5	38.10	10

DRILL SECTION

Carbon and High Speed Drills

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Taper Shank Twist Drills



Carbon Steel No. 102

High Speed Steel No. 602

Diameter	Price Each		Length Overall	Length of Twist	Taper Shank	Diameter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
1/16	\$0.45	\$0.90	4 3/8	1 1/4	No. 1	37/64	\$1.50	\$2.40	8 1/2	4 7/8	No. 2
5/64	.45	.90	4 1/2	1 3/8		19/32	1.50	2.40	8 1/2	4 7/8	
3/32	.41	.90	4 1/2	1 3/8		37/64	1.60	2.50	8 3/4	5 1/16	
7/64	.45	.90	4 5/8	1 9/16		5/8	1.60	2.50	8 3/4	5 1/16	
1/8	.45	.90	5 1/8	2 1/8		41/64	1.70	2.75	9	5 5/16	
9/64	.45	.90	5 1/4	2 1/4		21/32	1.70	2.75	9	5 5/16	
5/32	.45	.90	5 3/8	2 3/8		43/64	1.80	3.00	9 1/4	5 1/2	
11/64	.50	.90	5 3/4	2 11/16		11/16	1.80	3.00	9 1/4	5 1/2	
3/16	.50	.90	5 3/4	2 11/16		45/64	1.90	3.25	9 1/2	5 3/4	
13/64	.55	1.00	5 7/8	2 13/16		23/32	1.90	3.25	9 1/2	5 3/4	
7/32	.55	1.00	5 7/8	2 13/16		47/64	2.00	3.50	9 3/4	6	
15/64	.60	1.10	6 1/8	3		3/4	2.00	3.50	9 3/4	6	
1/4	.60	1.10	6 1/8	3		49/64	2.10	3.75	9 7/8	6 3/16	
17/64	.65	1.20	6 1/4	3 1/16		25/32	2.10	3.75	9 7/8	6 3/16	
9/32	.65	1.20	6 1/4	3 1/16		51/64	2.20	4.00	10	6 5/16	
19/64	.70	1.30	6 3/8	3 1/8		13/16	2.20	4.00	10	6 5/16	
5/16	.70	1.30	6 3/8	3 1/8		53/64	2.40	4.40	10 1/4	6 9/16	
21/64	.75	1.40	6 1/2	3 5/16		27/32	2.40	4.40	10 1/4	6 9/16	
11/32	.75	1.40	6 1/2	3 5/16		55/64	2.60	4.75	10 1/2	6 13/16	
23/64	.80	1.50	6 3/4	3 9/16		7/8	2.60	4.75	10 1/2	6 13/16	
3/8	.80	1.50	6 3/4	3 9/16		57/64	2.80	5.15	10 5/8	6 15/16	
25/64	.90	1.65	7	3 13/16		29/32	2.80	5.15	10 5/8	6 15/16	
13/32	.90	1.65	7	3 13/16							
27/64	1.00	1.75	7 1/4	4 1/16		59/64	3.00	5.50	10 3/4	6 1/4	No. 3
7/16	1.00	1.75	7 1/4	4 1/16		15/16	3.00	5.50	10 3/4	6 1/4	
29/64	1.10	1.90	7 1/2	4 3/8		61/64	3.25	5.90	10 7/8	6 3/8	
15/32	1.10	1.90	7 1/2	4 3/8		31/32	3.25	5.90	10 7/8	6 3/8	
31/64	1.20	2.00	7 3/4	4 5/8		63/64	3.50	6.25	11	6 1/2	
1/2	1.20	2.00	7 3/4	4 5/8		1	3.50	6.25	11	6 1/2	
33/64	1.30	2.15	8	4 7/8		1 1/64	3.75	6.75	11 1/8	6 5/8	
17/32	1.30	2.15	8	4 7/8		1 1/32	3.75	6.75	11 1/8	6 5/8	
35/64	1.40	2.25	8 1/4	5 1/8		1 3/64	4.00	7.25	11 1/4	6 3/4	
9/16	1.40	2.25	8 1/4	5 1/8		1 1/16	4.00	7.25	11 1/4	6 3/4	
						1 5/64	4.25	7.75	11 1/2	7	
						1 3/32	4.25	7.75	11 1/2	7	

Continued on next page

For Sets of these Drills, see page 244. For Millimeter Taper Shank Drills, see pages 233 and 234.

Specify our list number when ordering

Taper Shank Twist Drills



Carbon Steel No. 102

High Speed Steel No. 602

Diameter	Price Each		Length Overall	Length of Twist	Taper Shank	Diameter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
1 7/64	\$4.50	\$8.25	11 3/4	7 1/4	No. 3	1 39/64	\$10.50	\$21.00	15 1/2	9 7/8	No. 4
1 1/8	4.50	8.25	11 3/4	7 1/4		1 5/8	10.50	21.00	15 1/2	9 7/8	
1 9/64	4.75	8.90	11 7/8	7 3/8		1 41/64	11.00	22.00	15 5/8	10	
1 5/32	4.75	8.90	11 7/8	7 3/8		1 21/32	11.00	22.00	15 5/8	10	
1 11/64	5.00	9.50	12	7 1/2		1 43/64	11.50	23.00	15 3/4	10 1/8	
1 3/16	5.00	9.50	12	7 1/2		1 11/16	11.50	23.00	15 3/4	10 1/8	
1 13/64	5.25	10.15	12 1/8	7 5/8		1 45/64	12.00	24.00	15 7/8	10 1/4	
1 7/32	5.25	10.15	12 1/8	7 5/8		1 23/32	12.00	24.00	15 7/8	10 1/4	
1 15/64	5.50	10.75	12 1/2	8		1 47/64	12.50	25.00	16	10 1/4	
1 1/4	5.50	10.75	12 1/2	8		1 3/4	12.50	25.00	16	10 1/4	
1 17/64	5.75	11.50	14 1/8	8 1/2	No. 4	1 49/64	13.25	26.25	16 1/8	10 1/4	No. 5
1 9/32	5.75	11.50	14 1/8	8 1/2		1 25/32	13.25	26.25	16 1/8	10 1/4	
1 19/64	6.00	12.25	14 1/4	8 5/8		1 51/64	14.00	27.50	16 1/4	10 3/8	
1 5/16	6.00	12.25	14 1/4	8 5/8		1 13/16	14.00	27.50	16 1/4	10 3/8	
1 21/64	6.25	13.00	14 3/8	8 3/4		1 53/64	14.75	28.75	16 3/8	10 1/2	
1 11/32	6.25	13.00	14 3/8	8 3/4		1 27/32	14.75	28.75	16 3/8	10 1/2	
1 23/64	6.50	13.75	14 1/2	8 7/8		1 55/64	15.50	30.00	16 1/2	10 9/16	
1 3/8	6.50	13.75	14 1/2	8 7/8		1 7/8	15.50	30.00	16 1/2	10 9/16	
1 25/64	7.00	14.65	14 5/8	9		1 57/64	16.25	31.25	16 1/2	10 9/16	
1 13/32	7.00	14.65	14 5/8	9		1 29/32	16.25	31.25	16 1/2	10 9/16	
1 27/64	7.50	15.50	14 3/4	9 1/8	No. 5	1 59/64	17.00	32.50	16 1/2	10 9/16	No. 6
1 7/16	7.50	15.50	14 3/4	9 1/8		1 15/16	17.00	32.50	16 1/2	10 9/16	
1 29/64	8.00	16.40	14 7/8	9 1/4		1 61/64	17.75	33.75	16 1/2	10 9/16	
1 15/32	8.00	16.40	14 7/8	9 1/4		1 31/32	17.75	33.75	16 1/2	10 9/16	
1 31/64	8.50	17.25	15	9 3/8		1 63/64	18.50	35.00	16 1/2	10 9/16	
1 1/2	8.50	17.25	15	9 3/8		2	18.50	35.00	16 1/2	10 9/16	
1 33/64	9.00	18.15	15 1/8	9 1/2		2 1/64	19.25	36.25	16 1/2	9 1/2	
1 17/32	9.00	18.15	15 1/8	9 1/2		2 1/32	19.25	36.25	16 1/2	9 1/2	
1 35/64	9.50	19.00	15 1/4	9 5/8		2 3/64	20.00	37.50	17	10 1/16	
1 9/16	9.50	19.00	15 1/4	9 5/8		2 1/16	20.00	37.50	17	10 1/16	
1 37/64	10.00	20.00	15 3/8	9 3/4	No. 6	2 5/64	20.75	38.75	17	10 1/16	No. 7
1 19/32	10.00	20.00	15 3/8	9 3/4		2 3/32	20.75	38.75	17	10 1/16	

Continued on next page

Specify our list number when ordering

Taper Shank Twist Drills



Carbon Steel No. 102

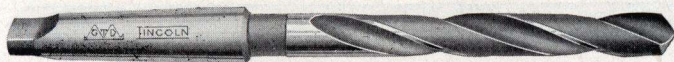
High Speed Steel No. 602

Diameter	Price Each		Length Overall	Length of Twist	Taper Shank	Diameter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
27 ⁶⁴ / ₆₄	\$21.50	\$40.00	17	10 ¹ / ₁₆	No. 5	24 ⁵ / ₆₄	\$37.00	\$82.50	20 ¹ / ₂	13 ¹ / ₄	No. 5
27 ⁸ / ₆₄	21.50	40.00	17	10 ¹ / ₁₆		22 ³ / ₃₂	37.00	82.50	20 ¹ / ₂	13 ¹ / ₄	
29 ⁶⁴ / ₆₄	22.25	41.25	17	10 ¹ / ₁₆		24 ⁷ / ₆₄	38.00	85.00	20 ¹ / ₂	13 ¹ / ₄	
25 ³² / ₆₄	22.25	41.25	17	10 ¹ / ₁₆		23 ⁴ / ₆₄	38.00	85.00	20 ¹ / ₂	13 ¹ / ₄	
21 ¹¹ / ₆₄	23.00	42.50	17	10 ¹ / ₁₆		24 ⁹ / ₆₄	39.25	87.50	20 ¹ / ₂	13 ¹ / ₄	
23 ¹⁶ / ₆₄	23.00	42.50	17	10 ¹ / ₁₆		22 ⁵ / ₃₂	39.25	87.50	20 ¹ / ₂	13 ¹ / ₄	
21 ³ / ₆₄	23.75	43.75	17 ¹ / ₂	10 ⁹ / ₁₆		25 ¹ / ₆₄	40.50	90.00	20 ¹ / ₂	13 ¹ / ₄	
27 ³² / ₆₄	23.75	43.75	17 ¹ / ₂	10 ⁹ / ₁₆		21 ³ / ₁₆	40.50	90.00	20 ¹ / ₂	13 ¹ / ₄	
21 ⁵ / ₆₄	24.50	45.00	17 ¹ / ₂	10 ⁹ / ₁₆		25 ³ / ₆₄	41.75	92.50	21	13 ³ / ₄	
21 ¹ / ₄	24.50	45.00	17 ¹ / ₂	10 ⁹ / ₁₆		22 ⁷ / ₃₂	41.75	92.50	21	13 ³ / ₄	
21 ⁷ / ₆₄	25.25	47.50	17 ¹ / ₂	10 ⁹ / ₁₆		25 ⁵ / ₆₄	43.00	95.00	21	13 ³ / ₄	
29 ³² / ₆₄	25.25	47.50	17 ¹ / ₂	10 ⁹ / ₁₆		27 ⁸ / ₆₄	43.00	95.00	21	13 ³ / ₄	
21 ⁹ / ₆₄	26.00	50.00	17 ¹ / ₂	10 ⁹ / ₁₆		25 ⁷ / ₆₄	44.25	97.50	21	13 ³ / ₄	No. 6
25 ¹⁶ / ₆₄	26.00	50.00	17 ¹ / ₂	10 ⁹ / ₁₆		22 ⁹ / ₃₂	44.25	97.50	21	13 ³ / ₄	
22 ¹ / ₆₄	26.75	52.50	18	10 ⁷ / ₈		25 ⁹ / ₆₄	45.50	100.00	21	13 ³ / ₄	
21 ¹ / ₃₂	26.75	52.50	18	10 ⁷ / ₈		21 ⁵ / ₁₆	45.50	100.00	21	13 ³ / ₄	
22 ³ / ₆₄	27.50	55.00	18	10 ⁷ / ₈		26 ¹ / ₆₄	46.75	102.50	22	14 ⁵ / ₈	
23 ⁸ / ₆₄	27.50	55.00	18	10 ⁷ / ₈		23 ¹ / ₃₂	46.75	102.50	22	14 ⁵ / ₈	
22 ⁵ / ₆₄	28.25	57.50	18 ¹ / ₂	11 ³ / ₈		26 ³ / ₆₄	48.00	105.00	22	14 ⁵ / ₈	
21 ³ / ₃₂	28.25	57.50	18 ¹ / ₂	11 ³ / ₈		3	48.00	105.00	22	14 ⁵ / ₈	
22 ⁷ / ₆₄	29.00	60.00	18 ¹ / ₂	11 ³ / ₈							
27 ¹⁶ / ₆₄	29.00	60.00	18 ¹ / ₂	11 ³ / ₈		31 ¹ / ₁₆	52.00	112.50	22	12 ¹ / ₂	
22 ⁹ / ₆₄	29.75	62.50	19	11 ⁷ / ₈		31 ⁸ / ₆₄	56.00	120.00	22	12 ¹ / ₂	
21 ⁵ / ₃₂	29.75	62.50	19	11 ⁷ / ₈		33 ³ / ₁₆	60.00	127.50	22	12 ¹ / ₂	
23 ¹ / ₆₄	30.50	65.00	19	11 ⁷ / ₈		31 ⁴ / ₆₄	65.00	135.00	23	13 ¹ / ₂	
21 ¹ / ₂	30.50	65.00	19	11 ⁷ / ₈		35 ⁵ / ₁₆	70.00	142.50	23	13 ¹ / ₂	
23 ³ / ₆₄	31.25	67.50	19 ¹ / ₄	12 ¹ / ₈		33 ⁸ / ₆₄	75.00	150.00	23	13 ¹ / ₂	
21 ⁷ / ₃₂	31.25	67.50	19 ¹ / ₄	12 ¹ / ₈		37 ¹ / ₁₆	80.00	157.50	23	13 ¹ / ₂	
23 ⁵ / ₆₄	32.00	70.00	19 ¹ / ₄	12 ¹ / ₈		31 ² / ₆₄	85.00	165.00	24	14 ³ / ₈	
29 ¹⁶ / ₆₄	32.00	70.00	19 ¹ / ₄	12 ¹ / ₈		35 ¹ / ₁₆	91.00	172.50	24	14 ³ / ₈	
23 ⁷ / ₆₄	33.00	72.50	19 ¹ / ₂	12 ³ / ₈		35 ⁸ / ₆₄	98.00	180.00	24	14 ³ / ₈	
21 ⁹ / ₃₂	33.00	72.50	19 ¹ / ₂	12 ³ / ₈		31 ¹ / ₁₆	105.00	187.50	24	14 ³ / ₈	
23 ⁹ / ₆₄	34.00	75.00	19 ¹ / ₂	12 ³ / ₈		33 ⁴ / ₆₄	112.00	195.00	24	14 ³ / ₈	
25 ⁸ / ₆₄	34.00	75.00	19 ¹ / ₂	12 ³ / ₈		31 ³ / ₁₆	119.00	202.50	24	14 ³ / ₈	
24 ¹ / ₆₄	35.00	77.50	20	12 ⁷ / ₈		37 ⁸ / ₆₄	126.00	210.00	24	14 ³ / ₈	
22 ¹ / ₃₂	35.00	77.50	20	12 ⁷ / ₈		31 ⁵ / ₁₆	133.00	217.50	24	14 ³ / ₈	
24 ³ / ₆₄	36.00	80.00	20	12 ⁷ / ₈		4	140.00	225.00	25	15 ¹ / ₈	
21 ¹ / ₁₆	36.00	80.00	20	12 ⁷ / ₈							

Specify our list number when ordering

Taper Shank Twist Drills

With Taper Shanks Larger Than Regular



Carbon Steel No. 103

High Speed Steel No. 603

Diam- eter	Price Each		Length Overall	Length of Twist	Taper Shank	Diam- eter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
$\frac{5}{16}$	\$1.40	\$2.80	$6\frac{1}{2}$	$2\frac{3}{4}$	No. 2	$\frac{7}{8}$	\$3.20	\$5.60	$10\frac{1}{2}$	$5\frac{1}{2}$	No. 3
$1\frac{1}{32}$	1.40	2.80	$6\frac{3}{4}$	3		$2\frac{9}{32}$	3.30	5.75	$10\frac{5}{8}$	$6\frac{1}{16}$	
$\frac{3}{8}$	1.40	2.80	7	$3\frac{1}{4}$		$1\frac{1}{8}$	5.40	10.50	$12\frac{1}{8}$	$6\frac{1}{4}$	
$1\frac{3}{32}$	1.40	2.80	$7\frac{1}{4}$	$3\frac{1}{2}$		$1\frac{5}{32}$	5.60	10.80	$12\frac{1}{4}$	$6\frac{1}{2}$	No. 4
$\frac{7}{16}$	1.40	2.80	$7\frac{1}{2}$	$3\frac{3}{4}$		$1\frac{3}{16}$	5.80	11.10	$12\frac{1}{2}$	$6\frac{3}{4}$	
$1\frac{5}{32}$	1.45	3.00	$7\frac{3}{4}$	4		$1\frac{7}{32}$	6.00	11.55	$12\frac{3}{4}$	7	
$\frac{1}{2}$	1.50	3.00	8	$4\frac{1}{4}$		$1\frac{1}{4}$	6.20	12.00	13	$7\frac{1}{4}$	
$1\frac{7}{32}$	1.60	3.20	$8\frac{1}{4}$	$4\frac{7}{16}$		$1\frac{3}{4}$	13.25	25.00	$16\frac{1}{2}$	$9\frac{1}{2}$	No. 5
$\frac{9}{16}$	1.70	3.20	$8\frac{1}{2}$	$4\frac{11}{16}$		$1\frac{25}{32}$	14.00	26.25	$16\frac{1}{2}$	$9\frac{1}{2}$	
$1\frac{9}{32}$	2.50	4.60	$9\frac{3}{8}$	$4\frac{13}{16}$		$1\frac{13}{16}$	14.75	27.50	$16\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{5}{8}$	2.50	4.60	$9\frac{1}{2}$	$4\frac{15}{16}$		$1\frac{27}{32}$	15.50	28.75	$16\frac{1}{2}$	$9\frac{1}{2}$	
$2\frac{1}{32}$	2.50	4.60	$9\frac{5}{8}$	$5\frac{1}{16}$		$1\frac{7}{8}$	16.25	30.00	$16\frac{1}{2}$	$9\frac{1}{2}$	
$1\frac{11}{16}$	2.60	4.60	$9\frac{3}{4}$	$5\frac{3}{16}$		$1\frac{29}{32}$	17.00	31.25	$16\frac{1}{2}$	$9\frac{1}{2}$	
$2\frac{3}{32}$	2.70	5.00	$9\frac{7}{8}$	$5\frac{5}{16}$		$1\frac{15}{16}$	17.75	32.50	$16\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{3}{4}$	2.80	5.00	10	$5\frac{7}{16}$		$1\frac{31}{32}$	18.50	33.75	$16\frac{1}{2}$	$9\frac{1}{2}$	
$2\frac{5}{32}$	2.90	5.00	$10\frac{1}{8}$	$5\frac{9}{16}$	No. 3	2	19.25	35.00	$16\frac{1}{2}$	$9\frac{1}{2}$	
$1\frac{13}{16}$	3.00	5.45	$10\frac{1}{4}$	$5\frac{11}{16}$							
$2\frac{7}{32}$	3.10	5.45	$10\frac{3}{8}$	$5\frac{13}{16}$							

64th sizes furnished at price of next larger size.

Specify our list number when ordering



Straight Shank Twist Drills

Taper Shank Lengths



Carbon Steel No. 104

High Speed Steel No. 604

Diameter	Price Each		Length Overall	Length of Twist	Diameter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/16	\$0.45	\$0.90	3 5/8	1 1/2	19/32	\$1.50	\$2.40	8 1/2	5 5/8
5/64	.45	.90	4	1 5/8	39/64	1.60	2.50	8 3/4	5 3/4
3/32	.45	.90	4 3/8	1 7/8	5/8	1.60	2.50	8 3/4	5 3/4
7/64	.45	.90	4 3/4	2 1/4	41/64	1.70	2.75	9	5 7/8
1/8	.45	.90	5 1/8	2 5/8	21/32	1.70	2.75	9	5 7/8
9/64	.45	.90	5 3/8	3	43/64	1.80	3.00	9 1/4	6
5/32	.45	.90	5 3/8	3	11/16	1.80	3.00	9 1/4	6
11/64	.50	.90	5 3/4	3 1/2	45/64	1.90	3.25	9 1/2	6 3/16
3/16	.50	.90	5 3/4	3 1/2	23/32	1.90	3.25	9 1/2	6 3/16
13/64	.55	1.00	6	4	47/64	2.00	3.50	9 3/4	6 3/8
7/32	.55	1.00	6	4	3/4	2.00	3.50	9 3/4	6 3/8
15/64	.60	1.10	6 1/8	4 1/8	49/64	2.10	3.75	9 7/8	6 1/2
1/4	.60	1.10	6 1/8	4 1/8	25/32	2.10	3.75	9 7/8	6 1/2
17/64	.65	1.20	6 1/4	4 1/8	51/64	2.20	4.00	10	6 5/8
9/32	.65	1.20	6 1/4	4 1/8	13/16	2.20	4.00	10	6 5/8
19/64	.70	1.30	6 3/8	4 1/8	53/64	2.40	4.40	10 1/4	6 3/4
5/16	.70	1.30	6 3/8	4 1/8	27/32	2.40	4.40	10 1/4	6 3/4
21/64	.75	1.40	6 1/2	4 1/4	55/64	2.60	4.75	10 1/2	7
11/32	.75	1.40	6 1/2	4 1/4	7/8	2.60	4.75	10 1/2	7
23/64	.80	1.50	6 3/4	4 1/4	57/64	2.80	5.15	10 5/8	7
3/8	.80	1.50	6 3/4	4 1/4	29/32	2.80	5.15	10 5/8	7
25/64	.90	1.65	7	4 3/8	59/64	3.00	5.50	10 3/4	7
13/32	.90	1.65	7	4 3/8	15/16	3.00	5.50	10 3/4	7
27/64	1.00	1.75	7 1/4	4 5/8	61/64	3.25	5.90	10 7/8	7 1/8
7/16	1.00	1.75	7 1/4	4 5/8	31/32	3.25	5.90	10 7/8	7 1/8
29/64	1.10	1.90	7 1/2	4 7/8	63/64	3.50	6.25	11	7 3/16
15/32	1.10	1.90	7 1/2	4 7/8	1	3.50	6.25	11	7 3/16
31/64	1.20	2.00	7 3/4	5	11/64	3.75	6.75	11 1/8	7 5/16
1/2	1.20	2.00	7 3/4	5	11/32	3.75	6.75	11 1/8	7 5/16
33/64	1.30	2.15	8	5 1/4	13/64	4.00	7.25	11 1/4	7 3/8
17/32	1.30	2.15	8	5 1/4	11/16	4.00	7.25	11 1/4	7 3/8
35/64	1.40	2.25	8 1/4	5 3/8	15/64	4.25	7.75	11 1/2	7 5/8
9/16	1.40	2.25	8 1/4	5 3/8	13/32	4.25	7.75	11 1/2	7 5/8
37/64	1.50	2.40	8 1/2	5 5/8	17/64	4.50	8.25	11 3/4	7 7/8

Continued on next page

For Millimeter Straight Shank Drills, see pages 235 and 236.

Specify our list number when ordering

Straight Shank Twist Drills

Taper Shank Lengths



Carbon Steel No. 104

High Speed Steel No. 604

Diam-eter	Price Each		Length Overall	Length of Twist	Diam-eter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1 1/8	\$ 4.50	\$8.25	11 3/4	7 7/8	1 21/32	\$11.00	\$22.00	15 5/8	10 1/2
1 9/64	4.75	8.90	11 7/8	8	1 43/64	11.50	23.00	15 3/4	10 3/8
1 5/32	4.75	8.90	11 7/8	8	1 11/16	11.50	23.00	15 3/4	10 5/8
1 11/64	5.00	9.50	12	8 1/8	1 45/64	12.00	24.00	15 7/8	10 3/4
1 3/16	5.00	9.50	12	8 1/8	1 23/32	12.00	24.00	15 7/8	10 3/4
1 13/64	5.25	10.15	12 1/8	8 1/8	1 47/64	12.50	25.00	16	10 7/8
1 7/32	5.25	10.15	12 1/8	8 1/8	1 3/4	12.50	25.00	16	10 7/8
1 15/64	5.50	10.75	12 1/2	8 1/2	1 49/64	13.25	26.25	16 1/8	10 1/8
1 1/4	5.50	10.75	12 1/2	8 1/2	1 25/32	13.25	26.25	16 1/8	10 1/8
1 17/64	5.75	11.50	14 1/8	9 1/8	1 51/64	14.00	27.50	16 1/4	10 1/4
1 9/32	5.75	11.50	14 1/8	9 1/8	1 13/16	14.00	27.50	16 1/4	10 1/4
1 19/64	6.00	12.25	14 1/4	9 1/4	1 53/64	14.75	28.75	16 3/8	10 3/8
1 5/16	6.00	12.25	14 1/4	9 1/4	1 27/32	14.75	28.75	16 3/8	10 3/8
1 21/64	6.25	13.00	14 3/8	9 3/8	1 55/64	15.50	30.00	16 1/2	10 1/2
1 11/32	6.25	13.00	14 3/8	9 3/8	1 7/8	15.50	30.00	16 1/2	10 1/2
1 23/64	6.50	13.75	14 1/2	9 1/2	1 57/64	16.25	31.25	16 1/2	10 1/2
1 3/8	6.50	13.75	14 1/2	9 1/2	1 29/32	16.25	31.25	16 1/2	10 1/2
1 25/64	7.00	14.65	14 3/8	9 1/2	1 59/64	17.00	32.50	16 1/2	10 1/2
1 13/32	7.00	14.65	14 3/8	9 1/2	1 15/16	17.00	32.50	16 1/2	10 1/2
1 27/64	7.50	15.50	14 3/4	9 5/8	1 61/64	17.75	33.75	16 1/2	10 1/2
1 7/16	7.50	15.50	14 3/4	9 5/8	1 31/32	17.75	33.75	16 1/2	10 1/2
1 29/64	8.00	16.40	14 7/8	9 3/4	1 63/64	18.50	35.00	16 1/2	10 1/2
1 15/32	8.00	16.40	14 7/8	9 3/4	2	18.50	35.00	16 1/2	10 1/2
1 31/64	8.50	17.25	15	9 7/8	2 1/64	19.25	36.25	16 1/2	9 7/8
1 1/2	8.50	17.25	15	9 7/8	2 1/32	19.25	36.25	16 1/2	9 7/8
1 33/64	9.00	18.15	15 1/8	10	2 3/64	20.00	37.50	17	10 3/8
1 17/32	9.00	18.15	15 1/8	10	2 1/16	20.00	37.50	17	10 3/8
1 35/64	9.50	19.00	15 1/4	10 1/8	2 5/64	20.75	38.75	17	10 3/8
1 9/16	9.50	19.00	15 1/4	10 1/8	2 3/32	20.75	38.75	17	10 3/8
1 37/64	10.00	20.00	15 3/8	10 1/4	2 7/64	21.50	40.00	17	10 3/8
1 19/32	10.00	20.00	15 3/8	10 1/4	2 1/8	21.50	40.00	17	10 3/8
1 39/64	10.50	21.00	15 1/2	10 3/8	2 9/64	22.25	41.25	17	10 3/8
1 5/8	10.50	21.00	15 1/2	10 3/8	2 5/32	22.25	41.25	17	10 3/8
1 41/64	11.00	22.00	15 5/8	10 1/2	2 11/64	23.00	42.50	17	10 3/8

Continued on next page

Specify our list number when ordering



Straight Shank Twist Drills

Taper Shank Lengths



Carbon Steel No. 104

High Speed Steel No. 604

Diam- eter	Price Each		Length Overall	Length of Twist	Diam- eter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
23 $\frac{3}{16}$	\$23.00	\$42.50	17	10 $\frac{3}{8}$	247 $\frac{1}{64}$	\$38.00	\$85.00	20 $\frac{1}{2}$	13 $\frac{7}{8}$
213 $\frac{1}{64}$	23.75	43.75	17 $\frac{1}{2}$	10 $\frac{7}{8}$	234	38.00	85.00	20 $\frac{1}{2}$	13 $\frac{7}{8}$
21 $\frac{3}{32}$	23.75	43.75	17 $\frac{1}{2}$	10 $\frac{7}{8}$	249 $\frac{1}{64}$	39.25	87.50	20 $\frac{1}{2}$	13 $\frac{7}{8}$
213 $\frac{1}{64}$	24.50	45.00	17 $\frac{1}{2}$	10 $\frac{7}{8}$	225 $\frac{3}{32}$	39.25	87.50	20 $\frac{1}{2}$	13 $\frac{7}{8}$
21 $\frac{1}{4}$	24.50	45.00	17 $\frac{1}{2}$	10 $\frac{7}{8}$	251 $\frac{1}{64}$	40.50	90.00	20 $\frac{1}{2}$	13 $\frac{7}{8}$
217 $\frac{1}{64}$	25.25	47.50	17 $\frac{1}{2}$	10 $\frac{7}{8}$	213 $\frac{1}{16}$	40.50	90.00	20 $\frac{1}{2}$	13 $\frac{7}{8}$
29 $\frac{3}{32}$	25.25	47.50	17 $\frac{1}{2}$	10 $\frac{7}{8}$	253 $\frac{1}{64}$	41.75	92.50	21	14 $\frac{3}{8}$
219 $\frac{1}{64}$	26.00	50.00	17 $\frac{1}{2}$	10 $\frac{7}{8}$	227 $\frac{3}{32}$	41.75	92.50	21	14 $\frac{3}{8}$
25 $\frac{1}{16}$	26.00	50.00	17 $\frac{1}{2}$	10 $\frac{7}{8}$	255 $\frac{1}{64}$	43.00	95.00	21	14 $\frac{3}{8}$
221 $\frac{1}{64}$	26.75	52.50	18	11 $\frac{3}{8}$	278	43.00	95.00	21	14 $\frac{3}{8}$
211 $\frac{3}{32}$	26.75	52.50	18	11 $\frac{3}{8}$	257 $\frac{1}{64}$	44.25	97.50	21	14 $\frac{3}{8}$
223 $\frac{1}{64}$	27.50	55.00	18	11 $\frac{3}{8}$	229 $\frac{3}{32}$	44.25	97.50	21	14 $\frac{3}{8}$
238	27.50	55.00	18	11 $\frac{3}{8}$	259 $\frac{1}{64}$	45.50	100.00	21	14 $\frac{3}{8}$
225 $\frac{1}{64}$	28.25	57.50	18 $\frac{1}{2}$	11 $\frac{7}{8}$	215 $\frac{1}{16}$	45.50	100.00	21	14 $\frac{3}{8}$
213 $\frac{3}{32}$	28.25	57.50	18 $\frac{1}{2}$	11 $\frac{7}{8}$	261 $\frac{1}{64}$	46.75	102.50	22	15 $\frac{3}{8}$
227 $\frac{1}{64}$	29.00	60.00	18 $\frac{1}{2}$	11 $\frac{7}{8}$	231 $\frac{3}{32}$	46.75	102.50	22	15 $\frac{3}{8}$
27 $\frac{1}{16}$	29.00	60.00	18 $\frac{1}{2}$	11 $\frac{7}{8}$	263 $\frac{1}{64}$	48.00	105.00	22	15 $\frac{3}{8}$
229 $\frac{1}{64}$	29.75	62.50	19	12 $\frac{3}{8}$	3	48.00	105.00	22	15 $\frac{3}{8}$
215 $\frac{3}{32}$	29.75	62.50	19	12 $\frac{3}{8}$	31 $\frac{1}{16}$	52.00	112.50	22	15 $\frac{3}{8}$
231 $\frac{1}{64}$	30.50	65.00	19	12 $\frac{3}{8}$	31 $\frac{1}{8}$	56.00	120.00	22	15 $\frac{3}{8}$
21 $\frac{1}{2}$	30.50	65.00	19	12 $\frac{3}{8}$	33 $\frac{1}{64}$	60.00	127.50	22	15 $\frac{3}{8}$
233 $\frac{1}{64}$	31.25	67.50	19 $\frac{1}{4}$	12 $\frac{5}{8}$	31 $\frac{1}{4}$	65.00	135.00	23	16 $\frac{1}{4}$
217 $\frac{3}{32}$	31.25	67.50	19 $\frac{1}{4}$	12 $\frac{5}{8}$	35 $\frac{1}{16}$	70.00	142.50	23	16 $\frac{1}{4}$
235 $\frac{1}{64}$	32.00	70.00	19 $\frac{1}{4}$	12 $\frac{5}{8}$	33 $\frac{3}{8}$	75.00	150.00	23	16 $\frac{1}{4}$
29 $\frac{1}{16}$	32.00	70.00	19 $\frac{1}{4}$	12 $\frac{5}{8}$	37 $\frac{1}{16}$	80.00	157.50	23	16 $\frac{1}{4}$
237 $\frac{1}{64}$	33.00	72.50	19 $\frac{1}{2}$	12 $\frac{7}{8}$	31 $\frac{1}{2}$	85.00	165.00	24	17 $\frac{1}{8}$
219 $\frac{3}{32}$	33.00	72.50	19 $\frac{1}{2}$	12 $\frac{7}{8}$	39 $\frac{1}{16}$	91.00	172.50	24	17 $\frac{1}{8}$
239 $\frac{1}{64}$	34.00	75.00	19 $\frac{1}{2}$	12 $\frac{7}{8}$	35 $\frac{3}{8}$	98.00	180.00	24	17 $\frac{1}{8}$
258	34.00	75.00	19 $\frac{1}{2}$	12 $\frac{7}{8}$	311 $\frac{1}{16}$	105.00	187.50	24	17 $\frac{1}{8}$
241 $\frac{1}{64}$	35.00	77.50	20	13 $\frac{3}{8}$	334	112.00	195.00	24	17 $\frac{1}{8}$
221 $\frac{3}{32}$	35.00	77.50	20	13 $\frac{3}{8}$	313 $\frac{1}{16}$	119.00	202.50	24	17 $\frac{1}{8}$
243 $\frac{1}{64}$	36.00	80.00	20	13 $\frac{3}{8}$	378	126.00	210.00	24	17 $\frac{1}{8}$
211 $\frac{1}{16}$	36.00	80.00	20	13 $\frac{3}{8}$	315 $\frac{1}{16}$	133.00	217.50	24	17 $\frac{1}{8}$
245 $\frac{1}{64}$	37.00	82.50	20 $\frac{1}{2}$	13 $\frac{7}{8}$	4	140.00	225.00	25	18 $\frac{1}{8}$
223 $\frac{3}{32}$	37.00	82.50	20 $\frac{1}{2}$	13 $\frac{7}{8}$					

Specify our list number when ordering

Straight Shank Twist Drills

Jobbers or Short Lengths



Carbon Steel No. 105

High Speed Steel No. 605

Diameter	Price Per Dozen		Length Overall	Length of Twist
	Carbon Steel	High Speed		
1/32	\$1.50	....	1 1/2	5/8
3/64	1.55	....	1 3/4	7/8
1/16	1.60	\$5.70	2 1/2	1 1/4
5/64	1.65	5.70	2 5/8	1 3/8
3/32	1.70	5.70	2 3/4	1 1/2
7/64	1.75	5.90	2 7/8	1 5/8
1/8	1.80	5.90	3	1 3/4
9/64	1.85	6.10	3 1/8	1 7/8
5/32	1.90	6.10	3 1/4	2
11/64	2.00	6.30	3 3/8	2 1/8
3/16	2.25	6.30	3 1/2	2 1/4
13/64	2.50	7.00	3 5/8	2 3/8
7/32	2.75	7.00	3 3/4	2 1/2
15/64	3.00	7.35	3 7/8	2 5/8
1/4	3.25	7.35	4	2 3/4
17/64	3.50	9.10	4 1/8	2 7/8
9/32	3.80	9.10	4 1/4	2 31/32
19/64	4.00	10.50	4 3/8	3 3/32
5/16	4.35	10.50	4 1/2	3 3/16
21/64	4.70	12.00	4 5/8	3 5/16
11/32	5.05	12.00	4 3/4	3 13/32
23/64	5.50	13.50	4 7/8	3 17/32
3/8	6.00	13.50	5	3 5/8
25/64	6.50	15.00	5 1/8	3 3/4
13/32	7.00	15.00	5 1/4	3 27/32
27/64	7.75	17.00	5 3/8	3 31/32
7/16	8.50	17.00	5 1/2	4 1/16
29/64	9.25	18.75	5 5/8	4 9/16
15/32	10.00	18.75	5 3/4	4 9/32
31/64	11.00	20.00	5 7/8	4 13/32
1/2	12.00	20.00	6	4 1/2

For Sets of these Drills, see page 244.

For Millimeter Short Length Drills, see pages 237 and 238.

Specify our list number when ordering



Straight Shank Twist Drills

Letter Sizes



Carbon Steel No. 305

High Speed Steel No. 805

Size	Price per Dozen		Decimal Equivalent	Length Overall	Length of Twist
	Carbon Steel	High Speed			
A	\$3.00	\$7.35	.234	3 $\frac{13}{16}$	2 $\frac{19}{32}$
B	3.05	7.35	.238	3 $\frac{13}{16}$	2 $\frac{19}{32}$
C	3.10	7.35	.242	3 $\frac{13}{16}$	2 $\frac{19}{32}$
D	3.15	7.35	.246	3 $\frac{13}{16}$	2 $\frac{19}{32}$
E	3.25	7.35	.250	3 $\frac{13}{16}$	2 $\frac{9}{16}$
F	3.35	9.10	.257	4 $\frac{1}{4}$	3
G	3.45	9.10	.261	4 $\frac{1}{4}$	3
H	3.55	9.10	.266	4 $\frac{1}{4}$	3
I	3.65	9.10	.272	4 $\frac{1}{4}$	3
J	3.70	9.10	.277	4 $\frac{1}{4}$	3
K	3.80	9.10	.281	4 $\frac{1}{4}$	3
L	3.90	10.50	.290	4 $\frac{1}{4}$	2 $\frac{31}{32}$
M	4.00	10.50	.295	4 $\frac{1}{4}$	2 $\frac{31}{32}$
N	4.25	10.50	.302	4 $\frac{1}{4}$	2 $\frac{15}{16}$
O	4.40	10.50	.316	4 $\frac{1}{4}$	2 $\frac{15}{16}$
P	4.60	12.00	.323	4 $\frac{1}{2}$	3 $\frac{3}{16}$
Q	4.75	12.00	.332	4 $\frac{5}{8}$	3 $\frac{5}{16}$
R	5.00	12.00	.339	4 $\frac{5}{8}$	3 $\frac{5}{16}$
S	5.15	13.50	.348	4 $\frac{3}{4}$	3 $\frac{13}{32}$
T	5.30	13.50	.358	4 $\frac{3}{4}$	3 $\frac{13}{32}$
U	5.50	13.50	.368	4 $\frac{7}{8}$	3 $\frac{17}{32}$
V	6.00	13.50	.377	5	3 $\frac{5}{8}$
W	6.50	15.00	.386	5	3 $\frac{5}{8}$
X	6.75	15.00	.397	5 $\frac{1}{8}$	3 $\frac{3}{4}$
Y	7.00	15.00	.404	5 $\frac{1}{8}$	3 $\frac{3}{4}$
Z	7.25	17.00	.413	5 $\frac{1}{4}$	3 $\frac{27}{32}$

For Sets of these Drills, see page 244.

Specify our list number when ordering

Straight Shank Wire Drills



Carbon Steel No. 205

High Speed Steel No. 705

Number by Gage	Price Per Dozen		Decimal Equivalent	Length Overall	Length of Twist
	Carbon Steel	High Speed			
1	\$2.75	\$7.00	.2280	4	2 ²¹ / ₃₂
2	2.75	7.00	.2210	3 ¹⁵ / ₁₆	2 ⁵ / ₈
3	2.75	7.00	.2130	3 ¹⁵ / ₁₆	2 ⁵ / ₈
4	2.75	7.00	.2090	3 ⁷ / ₈	2 ¹⁹ / ₃₂
5	2.75	7.00	.2055	3 ¹³ / ₁₆	2 ⁹ / ₁₆
6	2.50	7.00	.2040	3 ¹³ / ₁₆	2 ¹⁷ / ₃₂
7	2.50	7.00	.2010	3 ³ / ₄	2 ⁷ / ₂
8	2.50	7.00	.1990	3 ¹¹ / ₁₆	2 ¹⁵ / ₃₂
9	2.50	7.00	.1960	3 ¹¹ / ₁₆	2 ⁷ / ₁₆
10	2.50	7.00	.1935	3 ⁵ / ₈	2 ³ / ₈
11	2.25	6.30	.1910	3 ⁹ / ₁₆	2 ¹¹ / ₃₂
12	2.25	6.30	.1890	3 ⁹ / ₁₆	2 ⁵ / ₁₆
13	2.25	6.30	.1850	3 ¹ / ₂	2 ⁹ / ₃₂
14	2.25	6.30	.1820	3 ⁷ / ₁₆	2 ⁷ / ₄
15	2.25	6.30	.1800	3 ⁷ / ₁₆	2 ⁷ / ₃₂
16	2.00	6.30	.1770	3 ³ / ₈	2 ³ / ₁₆
17	2.00	6.30	.1730	3 ⁵ / ₁₆	2 ⁵ / ₃₂
18	2.00	6.30	.1695	3 ⁵ / ₁₆	2 ¹ / ₈
19	2.00	6.30	.1660	3 ¹ / ₄	2 ³ / ₃₂
20	2.00	6.30	.1610	3 ³ / ₁₆	2 ¹ / ₁₆
21	1.90	6.10	.1590	3 ³ / ₁₆	2 ¹ / ₁₆
22	1.90	6.10	.1570	3 ¹ / ₈	2
23	1.90	6.10	.1540	3 ¹ / ₁₆	1 ³¹ / ₃₂
24	1.90	6.10	.1520	3 ¹ / ₁₆	1 ¹⁵ / ₁₆
25	1.90	6.10	.1495	3	1 ²⁹ / ₃₂
26	1.80	6.10	.1470	2 ¹⁵ / ₁₆	1 ⁷ / ₈
27	1.80	6.10	.1440	2 ¹⁵ / ₁₆	1 ²⁷ / ₃₂
28	1.80	6.10	.1405	2 ⁷ / ₈	1 ¹³ / ₁₆
29	1.80	6.10	.1360	2 ¹³ / ₁₆	1 ³ / ₄
30	1.80	6.10	.1285	2 ¹³ / ₁₆	1 ²³ / ₃₂
31	1.75	5.90	.1200	2 ³ / ₄	1 ¹¹ / ₁₆
32	1.75	5.90	.1160	2 ¹¹ / ₁₆	1 ⁵ / ₈
33	1.75	5.90	.1130	2 ¹¹ / ₁₆	1 ⁵ / ₈
34	1.75	5.90	.1110	2 ⁵ / ₈	1 ⁹ / ₁₆
35	1.75	5.90	.1100	2 ⁹ / ₁₆	1 ¹ / ₂
36	1.75	5.90	.1065	2 ⁹ / ₁₆	1 ¹ / ₂
37	1.75	5.90	.1040	2 ¹ / ₂	1 ⁷ / ₁₆
38	1.75	5.90	.1015	2 ⁷ / ₁₆	1 ³ / ₈
39	1.75	5.90	.0995	2 ⁷ / ₁₆	1 ¹¹ / ₃₂
40	1.75	5.90	.0980	2 ³ / ₈	1 ¹¹ / ₃₂

Continued on next page

Specify our list number when ordering



Straight Shank Wire Drills



Carbon Steel No. 205

High Speed Steel No. 705

Number by Gage	Price Per Dozen		Decimal Equivalent	Length Overall	Length of Twist
	Carbon Steel	High Speed			
41	\$1.70	\$5.70	.0960	2 $\frac{5}{16}$	1 $\frac{5}{16}$
42	1.70	5.70	.0935	2 $\frac{5}{16}$	1 $\frac{1}{4}$
43	1.70	5.70	.0890	2 $\frac{1}{4}$	1 $\frac{7}{32}$
44	1.70	5.70	.0860	2 $\frac{3}{16}$	1 $\frac{3}{16}$
45	1.70	5.70	.0820	2 $\frac{3}{16}$	1 $\frac{1}{8}$
46	1.65	5.70	.0810	2 $\frac{7}{8}$	1 $\frac{1}{8}$
47	1.65	5.70	.0785	2 $\frac{1}{16}$	1 $\frac{3}{32}$
48	1.65	5.70	.0760	2 $\frac{1}{16}$	1 $\frac{1}{16}$
49	1.65	5.70	.0730	2	1
50	1.65	5.70	.0700	1 $\frac{15}{16}$	3 $\frac{1}{32}$
51	1.60	5.70	.0670	1 $\frac{15}{16}$	1 $\frac{5}{16}$
52	1.60	5.70	.0635	1 $\frac{7}{8}$	7 $\frac{7}{8}$
53	1.60	5.70	.0595	1 $\frac{13}{16}$	2 $\frac{7}{32}$
54	1.60	5.70	.0550	1 $\frac{13}{16}$	2 $\frac{7}{32}$
55	1.60	5.70	.0520	1 $\frac{3}{4}$	1 $\frac{13}{16}$
56	1.55	5.70	.0465	1 $\frac{11}{16}$	2 $\frac{5}{32}$
57	1.55	5.70	.0430	1 $\frac{11}{16}$	2 $\frac{3}{32}$
58	1.55	5.70	.0420	1 $\frac{5}{8}$	2 $\frac{3}{32}$
59	1.55	5.70	.0410	1 $\frac{9}{16}$	1 $\frac{11}{16}$
60	1.55	5.70	.0400	1 $\frac{9}{16}$	1 $\frac{11}{16}$
61	1.50		.0390	1 $\frac{1}{2}$	5 $\frac{5}{8}$
62	1.50		.0380	1 $\frac{1}{2}$	5 $\frac{5}{8}$
63	1.50		.0370	1 $\frac{1}{2}$	5 $\frac{5}{8}$
64	1.50		.0360	1 $\frac{1}{2}$	5 $\frac{5}{8}$
65	1.50		.0350	1 $\frac{1}{2}$	5 $\frac{5}{8}$
66	1.50		.0330	1 $\frac{1}{2}$	9 $\frac{9}{16}$
67	1.50		.0320	1 $\frac{7}{16}$	9 $\frac{9}{16}$
68	1.50		.0310	1 $\frac{7}{16}$	9 $\frac{9}{16}$
69	1.50		.0292	1 $\frac{3}{8}$	9 $\frac{9}{16}$
70	1.50		.0280	1 $\frac{5}{16}$	9 $\frac{9}{16}$
71	1.50		.0260	1 $\frac{5}{16}$	1 $\frac{1}{2}$
72	1.50		.0250	1 $\frac{1}{4}$	7 $\frac{7}{16}$
73	1.50		.0240	1 $\frac{3}{16}$	3 $\frac{3}{8}$
74	1.50		.0225	1 $\frac{1}{8}$	5 $\frac{5}{16}$
75	1.50		.0210	1 $\frac{1}{16}$	1 $\frac{1}{4}$
76	1.50		.0200	1	1 $\frac{1}{4}$
77	1.50		.0180	1 $\frac{15}{16}$	7 $\frac{7}{32}$
78	1.50		.0160	7 $\frac{7}{8}$	7 $\frac{7}{32}$
79	1.50		.0145	1 $\frac{3}{16}$	3 $\frac{3}{16}$
80	1.50		.0135	3 $\frac{3}{4}$	3 $\frac{3}{16}$

For Sets of these Drills, see page 244.

For Millimeter Sizes of these Drills, see pages 237 and 238.

Specify our list number when ordering

Silver & Deming Drills— $\frac{1}{2}$ " Shanks

Short Lengths
Fitting Blacksmiths' Drill Presses



Carbon Steel No. 107

High Speed Steel No. 607

Shanks $\frac{1}{2}$ inch diameter and $2\frac{1}{4}$ inches long.

Diameter	Price Each		Length Overall	Length of Twist	Diameter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
$\frac{1}{8}$	\$0.45	..	$4\frac{7}{8}$	2	$27\frac{3}{32}$	\$2.00	\$3.15	6	$3\frac{5}{16}$
$\frac{5}{32}$	.45	..	$5\frac{1}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	2.10	3.30	6	$3\frac{5}{16}$
$\frac{3}{16}$	.50	..	$5\frac{3}{8}$	$2\frac{1}{2}$	$29\frac{3}{32}$	2.20	3.50	6	$3\frac{5}{16}$
$\frac{7}{32}$	.55	..	$5\frac{5}{8}$	$2\frac{3}{4}$	$15\frac{1}{16}$	2.30	3.70	6	$3\frac{5}{16}$
$\frac{1}{4}$	.60	\$1.10	6	$3\frac{1}{8}$	$31\frac{3}{32}$	2.40	3.90	6	$3\frac{5}{16}$
$\frac{9}{32}$	.65	1.20	6	$3\frac{1}{8}$	1	2.50	4.10	6	$3\frac{5}{16}$
$\frac{5}{16}$	.70	1.30	6	$3\frac{1}{8}$	$1\frac{1}{32}$	2.60	4.30	6	$3\frac{1}{4}$
$1\frac{1}{32}$	.75	1.40	6	$3\frac{1}{8}$	$1\frac{1}{16}$	2.70	4.50	6	$3\frac{1}{4}$
$\frac{3}{8}$	.80	1.45	6	$3\frac{1}{4}$	$1\frac{3}{32}$	2.80	4.75	6	$3\frac{1}{4}$
$1\frac{3}{32}$	.85	1.55	6	$3\frac{1}{4}$	$1\frac{1}{8}$	2.90	5.00	6	$3\frac{1}{4}$
$\frac{7}{16}$	.90	1.60	6	$3\frac{1}{4}$	$1\frac{5}{32}$	3.00	5.25	6	$3\frac{1}{4}$
$1\frac{5}{32}$	.95	1.70	6	$3\frac{1}{4}$	$1\frac{3}{16}$	3.10	5.50	6	$3\frac{1}{4}$
$\frac{1}{2}$	1.00	1.75	6	$3\frac{5}{16}$	$1\frac{7}{32}$	3.20	5.80	6	$3\frac{1}{4}$
$1\frac{7}{32}$	1.05	1.90	6	$3\frac{5}{16}$	$1\frac{1}{4}$	3.30	6.10	6	$3\frac{1}{4}$
$\frac{9}{16}$	1.10	2.05	6	$3\frac{5}{16}$	$1\frac{9}{32}$	3.45	6.40	6	$3\frac{1}{4}$
$1\frac{9}{32}$	1.20	2.20	6	$3\frac{5}{16}$	$1\frac{5}{16}$	3.60	6.70	6	$3\frac{1}{4}$
$\frac{5}{8}$	1.30	2.30	6	$3\frac{5}{16}$	$1\frac{11}{32}$	3.75	7.00	6	$3\frac{1}{4}$
$2\frac{1}{32}$	1.40	2.40	6	$3\frac{5}{16}$	$1\frac{3}{8}$	3.90	7.40	6	$3\frac{1}{4}$
$1\frac{1}{16}$	1.50	2.50	6	$3\frac{5}{16}$	$1\frac{13}{32}$	4.05	7.80	6	$3\frac{1}{4}$
$2\frac{3}{32}$	1.60	2.65	6	$3\frac{5}{16}$	$1\frac{7}{16}$	4.20	8.20	6	$3\frac{1}{4}$
$\frac{3}{4}$	1.70	2.75	6	$3\frac{5}{16}$	$1\frac{15}{32}$	4.35	8.60	6	$3\frac{1}{4}$
$2\frac{5}{32}$	1.80	2.90	6	$3\frac{5}{16}$	$1\frac{1}{2}$	4.50	9.00	6	$3\frac{1}{4}$
$1\frac{3}{16}$	1.90	3.00	6	$3\frac{5}{16}$					

High Speed Drills $\frac{3}{4}$ " and larger with $\frac{1}{2}$ " shanks furnished only at customers' risk, as we do not recommend these larger sizes for general use.

These drills are furnished with slabbed shanks unless otherwise specified.

Specify our list number when ordering



Coe's Drills — 5/8" Shanks

Fitting Blacksmiths' Drill Presses



Carbon Steel No. 108

High Speed Steel No. 608

Shanks are 2 1/4 inches long and .648 inch exact diameter—commonly called 5/8 inch.

Diam-eter	Price Each		Length Overall	Length of Twist	Diam-eter	Price Each		Length Overall	Length of Twist
	Car-bon Steel	High Speed				Car-bon Steel	High Speed		
1/8	\$0.50	..	4 7/8	2	3 1/32	\$2.40	\$3.90	6	3 5/16
5/32	.55	..	5 1/8	2 1/4	1	2.50	4.10	6	3 5/16
3/16	.60	..	5 3/8	2 1/2	1 1/32	2.60	4.30	6	3 1/4
7/32	.65	..	5 5/8	2 3/4	1 1/16	2.70	4.50	6	3 1/4
1/4	.70	\$1.20	6	3 1/8	1 3/32	2.80	4.75	6	3 1/4
9/32	.75	1.30	6	3 1/8	1 1/8	2.90	5.00	6	3 1/4
5/16	.80	1.40	6	3 1/8	1 5/32	3.00	5.25	6	3 1/4
11/32	.85	1.50	6	3 1/8	1 3/16	3.10	5.50	6	3 1/4
3/8	.90	1.55	6	3 1/4	1 7/32	3.20	5.80	6	3 1/4
13/32	.95	1.65	6	3 1/4	1 1/4	3.30	6.10	6	3 1/4
7/16	1.00	1.70	6	3 1/4	1 9/32	3.45	6.40	6	3 1/4
15/32	1.05	1.80	6	3 1/4	1 5/16	3.60	6.70	6	3 1/4
1/2	1.10	1.85	6	3 5/16	1 11/32	3.75	7.00	6	3 1/4
17/32	1.15	1.95	6	3 5/16	1 3/8	3.90	7.40	6	3 1/4
9/16	1.20	2.05	6	3 5/16	1 13/32	4.05	7.80	6	3 1/4
19/32	1.25	2.20	6	3 5/16	1 7/16	4.20	8.20	6	3 1/4
5/8	1.30	2.30	6	3 5/16	1 15/32	4.35	8.60	6	3 1/4
21/32	1.40	2.40	6	3 5/16	1 1/2	4.50	9.00	6	3 1/4
11/16	1.50	2.50	6	3 5/16	1 9/16	5.00	..	6	3 1/8
23/32	1.60	2.65	6	3 5/16	1 5/8	5.50	..	6	3 1/8
3/4	1.70	2.75	6	3 5/16	1 11/16	6.00	..	6	3 1/8
25/32	1.80	2.90	6	3 5/16	1 3/4	6.50	..	6	3 1/8
13/16	1.90	3.00	6	3 5/16	1 13/16	7.00	..	6	3 1/8
27/32	2.00	3.15	6	3 5/16	1 7/8	8.00	..	6	3 1/8
7/8	2.10	3.30	6	3 5/16	1 15/16	9.00	..	6	3 1/8
29/32	2.20	3.50	6	3 5/16	2	10.00	..	6	3 1/8
15/16	2.30	3.70	6	3 5/16					

High Speed Drills 3/4" and larger with 5/8" shanks furnished only at customers' risk, as we do not recommend these larger sizes for general use.

These drills are furnished with slabbed shanks unless otherwise specified.

Specify our list number when ordering

Prentice Drills— $\frac{1}{2}$ " Shanks

Fitting Blacksmiths' Drill Presses

Taper Shank Lengths



Carbon Steel No. 207

High Speed Steel No. 707

Shanks $\frac{1}{2}$ inch diameter and $2\frac{1}{2}$ inches long.

Diam- eter	Price Each		Length Overall	Length of Twist	Diam- eter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
$\frac{1}{8}$	\$0.45	..	$4\frac{7}{8}$	2	$\frac{27}{32}$	\$2.40	\$4.40	$10\frac{1}{4}$	$7\frac{1}{4}$
$\frac{5}{32}$	.45	..	$5\frac{1}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	2.60	4.75	$10\frac{1}{2}$	$7\frac{1}{16}$
$\frac{3}{16}$	.50	..	$5\frac{3}{8}$	$2\frac{1}{2}$	$\frac{29}{32}$	2.80	5.15	$10\frac{3}{8}$	$7\frac{9}{16}$
$\frac{7}{32}$	.55	..	$5\frac{5}{8}$	$2\frac{3}{4}$	$\frac{15}{16}$	3.00	5.50	$10\frac{3}{4}$	$7\frac{11}{16}$
$\frac{1}{4}$	.60	\$1.10	6	$3\frac{1}{8}$	$\frac{31}{32}$	3.25	5.90	$10\frac{7}{8}$	$7\frac{13}{16}$
$\frac{9}{32}$	.65	1.20	6	$3\frac{1}{8}$	1	3.50	6.25	11	$7\frac{15}{16}$
$\frac{5}{16}$	.70	1.30	6	$3\frac{1}{8}$	$\frac{11}{32}$	3.75	6.75	$11\frac{1}{8}$	8
$\frac{11}{32}$	.75	1.40	$6\frac{1}{2}$	$3\frac{9}{16}$	$\frac{11}{16}$	4.00	7.25	$11\frac{1}{4}$	$8\frac{1}{8}$
$\frac{3}{8}$	.80	1.50	$6\frac{3}{4}$	$3\frac{13}{16}$	$\frac{13}{32}$	4.25	7.75	$11\frac{1}{2}$	$8\frac{3}{8}$
$\frac{13}{32}$	.90	1.65	7	$4\frac{1}{16}$	$\frac{1}{8}$	4.50	8.25	$11\frac{3}{4}$	$8\frac{5}{8}$
$\frac{7}{16}$	1.00	1.75	$7\frac{1}{4}$	$4\frac{5}{16}$	$\frac{15}{32}$	4.75	8.90	$11\frac{7}{8}$	$8\frac{3}{4}$
$\frac{15}{32}$	1.10	1.90	$7\frac{1}{2}$	$4\frac{9}{16}$	$\frac{3}{16}$	5.00	9.50	12	$8\frac{7}{8}$
$\frac{1}{2}$	1.20	2.00	$7\frac{3}{4}$	$4\frac{13}{16}$	$\frac{17}{32}$	5.25	10.15	$12\frac{1}{8}$	9
$\frac{17}{32}$	1.30	2.15	8	$5\frac{1}{16}$	$\frac{1}{4}$	5.50	10.75	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{9}{16}$	1.40	2.25	$8\frac{1}{4}$	$5\frac{5}{16}$	$\frac{9}{32}$	5.75	11.50	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{19}{32}$	1.50	2.40	$8\frac{1}{2}$	$5\frac{9}{16}$	$\frac{15}{16}$	6.00	12.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{5}{8}$	1.60	2.50	$8\frac{3}{4}$	$5\frac{13}{16}$	$\frac{111}{32}$	6.25	13.00	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{21}{32}$	1.70	2.75	9	6	$\frac{3}{8}$	6.50	13.75	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{11}{16}$	1.80	3.00	$9\frac{1}{4}$	$6\frac{1}{4}$	$\frac{113}{32}$	7.00	14.65	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{23}{32}$	1.90	3.25	$9\frac{1}{2}$	$6\frac{1}{2}$	$\frac{17}{16}$	7.50	15.50	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{3}{4}$	2.00	3.50	$9\frac{3}{4}$	$6\frac{3}{4}$	$\frac{115}{32}$	8.00	16.40	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{25}{32}$	2.10	3.75	$9\frac{7}{8}$	$6\frac{7}{8}$	$\frac{1}{2}$	8.50	17.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{13}{16}$	2.20	4.00	10	7					

High Speed Drills $\frac{3}{4}$ " and larger with $\frac{1}{2}$ " shanks furnished only at customers' risk, as we do not recommend these larger sizes for general use.

These drills are furnished with slabbied shanks unless otherwise specified.

Specify our list number when ordering



Taper Square Shank Ratchet Drills



No. 1 Shank $\frac{3}{8}$ inch x $\frac{5}{8}$ inch x $1\frac{1}{2}$ inches long.

Carbon Steel No. 209

High Speed Steel No. 709

No. 2 Shank $\frac{1}{2}$ inch x $\frac{3}{4}$ inch x $1\frac{3}{4}$ inches long.

Carbon Steel No. 309

High Speed Steel No. 809

No. 1 Shank always furnished unless otherwise specified.

Diameter	Price Each		Length Overall	Length of Twist	Diameter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
$\frac{1}{8}$	\$0.90	\$2.30	$4\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{16}$	\$2.40	\$5.25	8	$5\frac{1}{2}$
$\frac{5}{32}$	.95	2.35	$4\frac{1}{2}$	$2\frac{1}{8}$	1	2.55	5.50	$8\frac{1}{2}$	$6\frac{1}{4}$
$\frac{3}{16}$	.95	2.40	$4\frac{1}{2}$	$2\frac{1}{8}$	$\frac{11}{32}$	2.70	5.75	$8\frac{1}{2}$	$6\frac{1}{4}$
$\frac{7}{32}$	1.00	2.45	5	$2\frac{1}{4}$	$\frac{11}{16}$	2.85	6.00	$8\frac{1}{2}$	$6\frac{1}{4}$
$\frac{1}{4}$	1.00	2.50	5	$2\frac{1}{4}$	$\frac{13}{32}$	3.00	6.30	$8\frac{1}{2}$	$6\frac{1}{4}$
$\frac{9}{32}$	1.05	2.55	5	$2\frac{1}{4}$	$\frac{1}{8}$	3.10	6.70	9	$6\frac{1}{2}$
$\frac{5}{16}$	1.10	2.60	5	$2\frac{1}{4}$	$\frac{15}{32}$	3.25	7.00	9	$6\frac{1}{2}$
$\frac{11}{32}$	1.15	2.65	5	$2\frac{3}{4}$	$\frac{3}{16}$	3.35	7.30	9	$6\frac{1}{2}$
$\frac{3}{8}$	1.20	2.70	6	$3\frac{3}{4}$	$\frac{7}{32}$	3.50	7.60	9	$6\frac{1}{2}$
$\frac{13}{32}$	1.25	2.75	$6\frac{1}{4}$	4	$\frac{1}{4}$	3.65	7.90	9	$6\frac{1}{2}$
$\frac{7}{16}$	1.25	2.80	$6\frac{1}{4}$	4	$\frac{9}{32}$	3.75	8.25	9	$6\frac{1}{2}$
$\frac{15}{32}$	1.30	2.85	$6\frac{1}{4}$	4	$\frac{5}{16}$	3.90	8.60	9	$6\frac{1}{2}$
$\frac{1}{2}$	1.30	2.90	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{11}{32}$	4.05	9.00	9	$6\frac{1}{2}$
$\frac{17}{32}$	1.35	2.95	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{13}{8}$	4.20	9.40	9	$6\frac{1}{2}$
$\frac{9}{16}$	1.35	3.00	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{13}{32}$	4.35	9.80	9	$6\frac{1}{2}$
$\frac{19}{32}$	1.40	3.10	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{7}{16}$	4.50	10.20	9	$6\frac{1}{2}$
$\frac{5}{8}$	1.40	3.20	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{15}{32}$	4.65	10.60	9	$6\frac{1}{2}$
$\frac{21}{32}$	1.45	3.30	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{1}{2}$	4.80	11.00	9	$6\frac{1}{2}$
$\frac{11}{16}$	1.45	3.40	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{9}{16}$	5.10	12.50	9	$6\frac{1}{2}$
$\frac{23}{32}$	1.50	3.50	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{5}{8}$	5.40	14.00	9	$6\frac{1}{2}$
$\frac{3}{4}$	1.55	3.65	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{11}{16}$	5.75	15.50	9	$6\frac{1}{2}$
$\frac{25}{32}$	1.65	3.80	$6\frac{1}{2}$	$4\frac{3}{8}$	$\frac{3}{4}$	6.10	17.00	9	$6\frac{1}{2}$
$\frac{13}{16}$	1.75	4.00	7	$4\frac{3}{4}$	$\frac{13}{16}$	6.50	18.50	9	$6\frac{1}{2}$
$\frac{27}{32}$	1.90	4.20	7	$4\frac{3}{4}$	$\frac{7}{8}$	6.90	20.50	9	$6\frac{1}{2}$
$\frac{7}{8}$	2.05	4.50	$7\frac{1}{2}$	$5\frac{1}{4}$	$\frac{15}{16}$	7.30	22.50	9	$6\frac{1}{2}$
$\frac{29}{32}$	2.20	4.70	$7\frac{1}{2}$	$5\frac{1}{4}$	2	7.75	25.00	6	$6\frac{1}{2}$
$\frac{15}{16}$	2.30	5.00	8	$5\frac{1}{2}$					

For Millimeter Ratchet Drills, see page 239.

Specify our list number when ordering

Bonding Drills

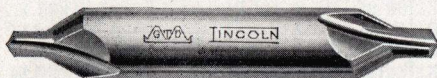


Carbon Steel No. 405

High Speed Steel No. 905

Diameter	Price per Dozen		Length Overall Inches	Length of Twist Inches	Decimal Diameter
	Carbon Steel	High Speed			
$\frac{9}{32}$	\$3.80	\$9.10	3	$1\frac{3}{4}$	.2812
$\frac{3}{8}$	6.00	13.50	3	$1\frac{3}{4}$	.375

Drills and Countersinks Combined



Carbon Steel No. 160

High Speed Steel No. 560

Size	Price per Dozen		Diameter of Body	Diameter of Drill Points	Decimal Diameter of Drill Points
	Carbon Steel	High Speed			
A-1	\$2.00	\$6.00	$\frac{1}{8}$	No. 57	.043
B-1	2.25	6.00	$\frac{5}{32}$	$\frac{3}{64}$	.0468
C-1	2.25	6.00	$\frac{13}{64}$	No. 55	.052
C-2	2.25	6.00	$\frac{13}{64}$	$\frac{1}{16}$	.0625
D-1	2.50	6.00	$\frac{15}{64}$	No. 49	.073
D-2	2.50	6.00	$\frac{15}{64}$	45	.082
E-1	2.75	6.00	$\frac{3}{10}$	$\frac{3}{32}$	.0938
E-2	2.75	6.00	$\frac{3}{10}$	$\frac{1}{8}$	.125
F-1	3.50	9.00	$\frac{7}{16}$	$\frac{5}{32}$	.1563
F-2	3.50	9.00	$\frac{7}{16}$	$\frac{3}{16}$	.1875

Stay Bolt Drills

For Tell-Tale Holes



Carbon Steel, List No. 495

High Speed Steel, List No. 995

Diameter Inches	Price per Dozen		Length Overall Inches	Length of Twist Inches
	Carbon Steel	High Speed Steel		
$\frac{3}{16}$	\$2.25	\$6.50	$3\frac{1}{2}$	$2\frac{5}{16}$
$\frac{1}{8}$	2.75	7.00	$3\frac{3}{4}$	$2\frac{17}{32}$

Specify our list number when ordering



Center Drills

Fractional Sizes



Carbon Steel No. 505

Diameter	Price per Dozen	Length Overall	Length of Twist	Diameter	Price per Dozen	Length Overall	Length of Twist
$\frac{1}{32}$	\$1.50	1	$\frac{1}{2}$	$\frac{3}{16}$	\$2.25	$1\frac{1}{2}$	1
$\frac{3}{64}$	1.55	1	$\frac{1}{2}$	$1\frac{3}{64}$	2.50	$1\frac{1}{2}$	1
$\frac{1}{16}$	1.60	1	$\frac{1}{2}$	$\frac{7}{32}$	2.75	$1\frac{1}{2}$	1
$\frac{5}{64}$	1.65	1	$\frac{1}{2}$	$1\frac{5}{64}$	3.00	$1\frac{1}{2}$	1
$\frac{3}{32}$	1.70	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	3.25	$1\frac{1}{2}$	1
$\frac{7}{64}$	1.75	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{7}{64}$	3.50	$1\frac{1}{2}$	1
$\frac{1}{8}$	1.80	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{9}{32}$	3.80	$1\frac{1}{2}$	1
$\frac{9}{64}$	1.85	$1\frac{1}{4}$	$\frac{3}{4}$	$1\frac{9}{64}$	4.00	$1\frac{1}{2}$	1
$\frac{5}{32}$	1.90	$1\frac{1}{2}$	1	$\frac{5}{16}$	4.35	$1\frac{1}{2}$	1
$1\frac{11}{64}$	2.00	$1\frac{1}{2}$	1				

Center Drills

Wire Gauge Sizes

Carbon Steel No. 505A

No. by Gauge	Price per Dozen	Length Overall	Length of Twist	No. by Gauge	Price per Dozen	Length Overall	Length of Twist
30	\$1.80	$1\frac{1}{4}$	$\frac{3}{4}$	45	\$1.70	$1\frac{1}{4}$	$\frac{3}{4}$
35	1.75	$1\frac{1}{4}$	$\frac{3}{4}$	50	1.65	$1\frac{1}{4}$	$\frac{3}{4}$
40	1.75	$1\frac{1}{4}$	$\frac{3}{4}$	55	1.60	$1\frac{1}{4}$	$\frac{3}{4}$

Specify our list number when ordering

Three Groove Twist Drills or Reamers—Taper Shanks



Carbon Steel No. 132

High Speed Steel No. 632

Diameter	Price Each		Length Overall	Length of Twist	Taper Shank	Diameter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
1/4	\$1.00	\$2.00	6 1/8	3	No. 1	1 3/8	\$6.50	\$17.00	14 1/2	8 7/8	No. 4
9/32	1.05	2.15	6 1/4	3 1/16		1 13/32	7.00	17.75	14 5/8	9	
5/16	1.10	2.25	6 3/8	3 1/8		1 7/16	7.50	18.50	14 3/4	9 1/8	
11/32	1.15	2.40	6 1/2	3 5/16		1 15/32	8.00	19.25	14 7/8	9 1/4	
3/8	1.20	2.50	6 3/4	3 9/16		1 1/2	8.50	20.00	15	9 3/8	
13/32	1.25	2.65	7	3 13/16		1 17/32	9.00	20.75	15 1/8	9 1/2	
7/16	1.30	2.75	7 1/4	4 1/16		1 9/16	9.50	21.50	15 1/4	9 5/8	
15/32	1.40	2.90	7 1/2	4 3/8		1 19/32	10.00	22.25	15 3/8	9 3/4	
1/2	1.50	3.00	7 3/4	4 5/8		1 5/8	10.50	23.00	15 1/2	9 7/8	
17/32	1.60	3.15	8	4 7/8		1 21/32	11.00	23.75	15 5/8	10	
9/16	1.70	3.25	8 1/4	5 1/8	No. 2	1 11/16	11.50	24.50	15 3/4	10 1/8	No. 5
19/32	1.80	3.50	8 1/2	4 7/8		1 23/32	12.00	25.50	15 7/8	10 1/4	
5/8	1.90	3.75	8 3/4	5 1/16		1 3/4	12.50	26.50	16	10 1/4	
21/32	2.00	4.00	9	5 5/16		1 25/32	13.25	27.50	16 1/8	10 1/4	
11/16	2.10	4.25	9 1/4	5 1/2		1 13/16	14.00	28.50	16 1/4	10 3/8	
23/32	2.25	4.65	9 1/2	5 3/4		1 27/32	14.75	29.50	16 3/8	10 1/2	
3/4	2.40	5.00	9 3/4	6		1 7/8	15.50	30.50	16 1/2	10 9/16	
25/32	2.55	5.40	9 7/8	6 3/16		1 29/32	16.25	31.50	16 1/2	10 9/16	
13/16	2.70	5.75	10	6 5/16		1 15/16	17.00	32.50	16 1/2	10 9/16	
27/32	2.85	6.15	10 1/4	6 9/16		1 31/32	17.75	33.50	16 1/2	10 9/16	
7/8	3.00	6.50	10 1/2	6 13/16	No. 3	2	18.50	34.50	16 1/2	10 9/16	No. 6
29/32	3.15	7.00	10 5/8	6 15/16		2 1/32	19.25	36.00	16 1/2	9 1/2	
15/16	3.30	7.50	10 3/4	6 1/4		2 1/16	20.00	37.50	17	10 1/16	
31/32	3.45	8.00	10 7/8	6 3/8		2 1/8	21.50	40.50	17	10 1/16	
1	3.60	8.50	11	6 1/2		2 3/16	23.00	43.75	17	10 1/16	
1 1/32	3.75	9.00	11 1/8	6 5/8		2 1/4	24.50	47.50	17 1/2	10 9/16	
1 1/16	4.00	9.50	11 1/4	6 3/4		2 5/16	26.00	52.50	17 1/2	10 9/16	
1 3/32	4.25	10.25	11 1/2	7		2 3/8	27.50	60.00	18	10 7/8	
1 1/8	4.50	11.00	11 3/4	7 1/4		2 7/16	29.00	65.00	18 1/2	11 3/8	
1 5/32	4.75	11.75	11 7/8	7 3/8		2 1/2	30.50	70.00	19	11 7/8	
1 3/16	5.00	12.50	12	7 1/2	No. 4	2 9/16	32.00	76.25	19 1/4	12 1/8	No. 7
1 7/32	5.25	13.25	12 1/8	7 5/8		2 5/8	34.00	82.50	19 1/2	12 3/8	
1 1/4	5.50	14.00	12 1/2	8		2 11/16	36.00	88.75	20	12 7/8	
1 9/32	5.75	14.75	14 1/8	8 1/2		2 3/4	38.00	95.00	20 1/2	13 1/4	
1 5/16	6.00	15.50	14 1/4	8 5/8		2 13/16	40.50	102.50	20 1/2	13 3/4	
1 11/32	6.25	16.25	14 3/8	8 3/4		2 7/8	43.00	110.00	21	13 3/4	
						2 15/16	45.50	117.50	21	13 3/4	
						3	48.00	125.00	22	14 5/8	

64th sizes to 1 1/2" inclusive take the price of next larger size
Specify our list number when ordering



Three Groove Twist Drills or Reamers—Straight Shanks



Carbon Steel No. 134

High Speed Steel No. 634

Diameter	Price Each		Length Overall	Length of Twist	Diameter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/4	\$1.00	\$2.00	6 1/8	4 1/8	1 13/32	\$7.00	\$17.75	14 5/8	9 1/2
9/32	1.05	2.15	6 1/4	4 1/8	1 7/16	7.50	18.50	14 3/4	9 5/8
5/16	1.10	2.25	6 3/8	4 1/8	1 15/32	8.00	19.25	14 7/8	9 3/4
11/32	1.15	2.40	6 1/2	4 1/4	1 1/2	8.50	20.00	15	9 7/8
3/8	1.20	2.50	6 3/4	4 1/4	1 17/32	9.00	20.75	15 1/8	10
13/32	1.25	2.65	7	4 3/8	1 9/16	9.50	21.50	15 1/4	10 1/8
7/16	1.30	2.75	7 1/4	4 5/8	1 19/32	10.00	22.25	15 3/8	10 1/4
15/32	1.40	2.90	7 1/2	4 7/8	1 5/8	10.50	23.00	15 1/2	10 3/8
1/2	1.50	3.00	7 3/4	5	1 21/32	11.00	23.75	15 5/8	10 1/2
17/32	1.60	3.15	8	5 1/4	1 11/16	11.50	24.50	15 3/4	10 5/8
9/16	1.70	3.25	8 1/4	5 3/8	1 23/32	12.00	25.50	15 7/8	10 3/4
19/32	1.80	3.50	8 1/2	5 5/8	1 3/4	12.50	26.50	16	10 7/8
5/8	1.90	3.75	8 3/4	5 3/4	1 25/32	13.25	27.50	16 1/8	10 1/8
21/32	2.00	4.00	9	5 7/8	1 13/16	14.00	28.50	16 1/4	10 1/4
11/16	2.10	4.25	9 1/4	6	1 27/32	14.75	29.50	16 3/8	10 5/8
23/32	2.25	4.65	9 1/2	6 3/16	1 7/8	15.50	30.50	16 1/2	10 1/2
3/4	2.40	5.00	9 3/4	6 3/8	1 29/32	16.25	31.50	16 1/2	10 1/2
25/32	2.55	5.40	9 7/8	6 1/2	1 15/16	17.00	32.50	16 1/2	10 1/2
13/16	2.70	5.75	10	6 5/8	1 31/32	17.75	33.50	16 1/2	10 1/2
27/32	2.85	6.15	10 1/4	6 3/4	2	18.50	34.50	16 1/2	10 1/2
7/8	3.00	6.50	10 1/2	7	2 1/32	19.25	36.00	16 1/2	9 7/8
29/32	3.15	7.00	10 5/8	7	2 1/16	20.00	37.50	17	10 3/8
15/16	3.30	7.50	10 3/4	7	2 1/8	21.50	40.50	17	10 3/8
31/32	3.45	8.00	10 7/8	7 1/8	2 3/16	23.00	43.75	17	10 3/8
1	3.60	8.50	11	7 3/16	2 1/4	24.50	47.50	17 1/2	10 7/8
1 1/32	3.75	9.00	11 1/8	7 5/16	2 5/16	26.00	52.50	17 1/2	10 7/8
1 1/16	4.00	9.50	11 1/4	7 3/8	2 3/8	27.50	60.00	18	11 3/8
1 3/32	4.25	10.25	11 1/2	7 5/8	2 7/16	29.00	65.00	18 1/2	11 7/8
1 1/8	4.50	11.00	11 3/4	7 7/8	2 1/2	30.50	70.00	19	12 3/8
1 5/32	4.75	11.75	11 7/8	8	2 9/16	32.00	76.25	19 1/4	12 5/8
1 3/16	5.00	12.50	12	8 1/8	2 5/8	34.00	82.50	19 1/2	12 7/8
1 7/32	5.25	13.25	12 1/8	8 1/8	2 11/16	36.00	88.75	20	13 3/8
1 1/4	5.50	14.00	12 1/2	8 1/2	2 3/4	38.00	95.00	20 1/2	13 7/8
1 9/32	5.75	14.75	14 1/8	9 1/8	2 13/16	40.50	102.50	20 1/2	13 7/8
1 5/16	6.00	15.50	14 1/4	9 1/4	2 7/8	43.00	110.00	21	14 3/8
1 11/32	6.25	16.25	14 3/8	9 3/8	2 15/16	45.50	117.50	21	14 3/8
1 3/8	6.50	17.00	14 1/2	9 1/2	3	48.00	125.00	22	15 3/8

64th sizes to 1 1/2" inclusive take the price of next larger size

Specify our list number when ordering

Four Groove Twist Drills or Reamers — Taper Shanks



Carbon Steel No. 142

High Speed Steel No. 642

Diameter	Price Each		Length Overall	Length of Twist	Taper Shank	Diameter	Price Each		Length Overall	Length of Twist	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
1/4	\$1.00	\$2.00	6 1/8	3	No. 1	1 3/8	\$6.50	\$17.00	14 1/2	8 7/8	No. 4
9/32	1.05	2.15	6 1/4	3 1/16		1 13/32	7.00	17.75	14 5/8	9	
5/16	1.10	2.25	6 3/8	3 1/8		1 7/16	7.50	18.50	14 3/4	9 1/8	
11/32	1.15	2.40	6 1/2	3 5/16		1 15/32	8.00	19.25	14 7/8	9 1/4	
3/8	1.20	2.50	6 3/4	3 9/16		1 1/2	8.50	20.00	15	9 3/8	
13/32	1.25	2.65	7	3 13/16		1 17/32	9.00	20.75	15 1/8	9 1/2	
7/16	1.30	2.75	7 1/4	4 1/16		1 9/16	9.50	21.50	15 1/4	9 5/8	
15/32	1.40	2.90	7 1/2	4 3/8		1 19/32	10.00	22.25	15 3/8	9 3/4	
1/2	1.50	3.00	7 3/4	4 5/8		1 5/8	10.50	23.00	15 1/2	9 7/8	
17/32	1.60	3.15	8	4 7/8		1 21/32	11.00	23.75	15 5/8	10	
9/16	1.70	3.25	8 1/4	5 1/8	No. 2	1 11/16	11.50	24.50	15 3/4	10 1/8	No. 4
19/32	1.80	3.50	8 1/2	4 7/8		1 23/32	12.00	25.50	15 7/8	10 1/4	
5/8	1.90	3.75	8 3/4	5 1/16		1 3/4	12.50	26.50	16	10 1/4	
21/32	2.00	4.00	9	5 5/16		1 25/32	13.25	27.50	16 1/8	10 1/4	
11/16	2.10	4.25	9 1/4	5 1/2		1 13/16	14.00	28.50	16 1/4	10 3/8	
23/32	2.25	4.65	9 1/2	5 3/4		1 27/32	14.75	29.50	16 3/8	10 1/2	
3/4	2.40	5.00	9 3/4	6		1 7/8	15.50	30.50	16 1/2	10 9/16	
25/32	2.55	5.40	9 7/8	6 3/16		1 29/32	16.25	31.50	16 1/2	10 9/16	
13/16	2.70	5.75	10	6 5/16		1 15/16	17.00	32.50	16 1/2	10 9/16	
27/32	2.85	6.15	10 1/4	6 9/16		1 31/32	17.75	33.50	16 1/2	10 9/16	
7/8	3.00	6.50	10 1/2	6 13/16	No. 3	2	18.50	34.50	16 1/2	10 9/16	No. 5
29/32	3.15	7.00	10 5/8	6 15/16		2 1/32	19.25	36.00	16 1/2	9 1/2	
15/16	3.30	7.50	10 3/4	6 1/4		2 1/16	20.00	37.50	17	10 1/16	
31/32	3.45	8.00	10 7/8	6 3/8		2 1/8	21.50	40.50	17	10 1/16	
1	3.60	8.50	11	6 1/2		2 3/16	23.00	43.75	17	10 1/16	
1 1/32	3.75	9.00	11 1/8	6 5/8		2 1/4	24.50	47.50	17 1/2	10 9/16	
1 1/16	4.00	9.50	11 1/4	6 3/4		2 5/16	26.00	52.50	17 1/2	10 9/16	
1 3/32	4.25	10.25	11 1/2	7		2 3/8	27.50	60.00	18	10 7/8	
1 1/8	4.50	11.00	11 3/4	7 1/4		2 7/16	29.00	65.00	18 1/2	11 3/8	
1 5/32	4.75	11.75	11 7/8	7 3/8		2 1/2	30.50	70.00	19	11 7/8	
1 3/16	5.00	12.50	12	7 1/2	No. 4	2 9/16	32.00	76.25	19 1/4	12 1/8	No. 5
1 7/32	5.25	13.25	12 1/8	7 5/8		2 5/8	34.00	82.50	19 1/2	12 3/8	
1 1/4	5.50	14.00	12 1/2	8		2 11/16	36.00	88.75	20	12 7/8	
1 9/32	5.75	14.75	14 1/8	8 1/2		2 3/4	38.00	95.00	20 1/2	13 1/4	
1 5/16	6.00	15.50	14 1/4	8 5/8		2 13/16	40.50	102.50	20 1/2	13 3/4	
1 11/32	6.25	16.25	14 3/8	8 3/4		2 7/8	43.00	110.00	21	13 3/4	
						2 15/16	45.50	117.50	21	13 3/4	
						3	48.00	125.00	22	14 5/8	

64th sizes to 1 1/2" inclusive take the price of next larger size
Specify our list number when ordering



Four Groove Twist Drills or Reamers—Straight Shanks



Carbon Steel No. 144

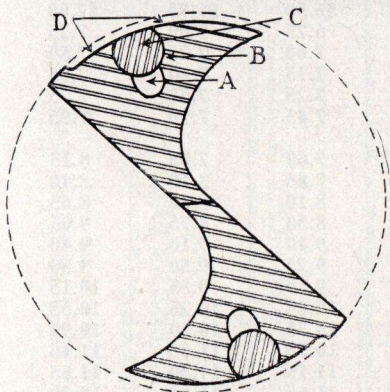
High Speed Steel No. 644


Diameter	Price Each		Length Overall	Length of Twist	Diameter	Price Each		Length Overall	Length of Twist
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/4	\$1.00	\$2.00	6 1/8	4 1/8	1 13/32	\$7.00	\$17.75	14 5/8	9 1/2
9/32	1.05	2.15	6 1/4	4 1/8	1 7/16	7.50	18.50	14 3/4	9 5/8
5/16	1.10	2.25	6 3/8	4 1/8	1 15/32	8.00	19.25	14 7/8	9 3/4
11/32	1.15	2.40	6 1/2	4 1/4	1 1/2	8.50	20.00	15	9 7/8
3/8	1.20	2.50	6 3/4	4 1/4	1 17/32	9.00	20.75	15 1/8	10
13/32	1.25	2.65	7	4 3/8	1 9/16	9.50	21.50	15 1/4	10 1/8
7/16	1.30	2.75	7 1/4	4 3/8	1 19/32	10.00	22.25	15 3/8	10 1/4
15/32	1.40	2.90	7 1/2	4 7/8	1 5/8	10.50	23.00	15 1/2	10 3/8
1/2	1.50	3.00	7 3/4	5	1 21/32	11.00	23.75	15 5/8	10 1/2
17/32	1.60	3.15	8	5 1/4	1 11/16	11.50	24.50	15 3/4	10 5/8
9/16	1.70	3.25	8 1/4	5 3/8	1 23/32	12.00	25.50	15 7/8	10 3/4
19/32	1.80	3.50	8 1/2	5 3/8	1 3/4	12.50	26.50	16	10 7/8
5/8	1.90	3.75	8 3/4	5 3/4	1 25/32	13.25	27.50	16 1/8	10 7/8
21/32	2.00	4.00	9	5 7/8	1 13/16	14.00	28.50	16 1/4	10 3/4
11/16	2.10	4.25	9 1/4	6	1 27/32	14.75	29.50	16 3/8	10 5/8
23/32	2.25	4.65	9 1/2	6 3/16	1 7/8	15.50	30.50	16 1/2	10 1/2
3/4	2.40	5.00	9 3/4	6 3/8	1 29/32	16.25	31.50	16 1/2	10 1/2
25/32	2.55	5.40	9 7/8	6 1/2	1 15/16	17.00	32.50	16 1/2	10 1/2
13/16	2.70	5.75	10	6 5/8	1 31/32	17.75	33.50	16 1/2	10 1/2
27/32	2.85	6.15	10 1/4	6 3/4	2	18.50	34.50	16 1/2	10 1/2
7/8	3.00	6.50	10 1/2	7	2 1/32	19.25	36.00	16 1/2	9 7/8
29/32	3.15	7.00	10 5/8	7	2 1/16	20.00	37.50	17	10 3/8
15/16	3.30	7.50	10 3/4	7	2 1/8	21.50	40.50	17	10 3/8
31/32	3.45	8.00	10 7/8	7 1/8	2 3/16	23.00	43.75	17	10 3/8
1	3.60	8.50	11	7 3/16	2 7/4	24.50	47.50	17 1/2	10 7/8
1 1/32	3.75	9.00	11 1/8	7 5/16	2 5/16	26.00	52.50	17 1/2	10 7/8
1 1/16	4.00	9.50	11 1/4	7 3/8	2 3/8	27.50	60.00	18	11 3/8
1 3/32	4.25	10.25	11 1/2	7 5/8	2 7/16	29.00	65.00	18 1/2	11 7/8
1 1/8	4.50	11.00	11 3/4	7 7/8	2 1/2	30.50	70.00	19	12 3/8
1 5/32	4.75	11.75	11 7/8	8	2 9/16	32.00	76.25	19 1/4	12 5/8
1 3/16	5.00	12.50	12	8 1/8	2 5/8	34.00	82.50	19 1/2	12 7/8
1 7/32	5.25	13.25	12 1/8	8 1/8	2 11/16	36.00	88.75	20	13 3/8
1 1/4	5.50	14.00	12 1/2	8 1/2	2 3/4	38.00	95.00	20 1/2	13 7/8
1 9/32	5.75	14.75	14 1/8	9 1/8	2 13/16	40.50	102.50	20 1/2	13 7/8
1 5/16	6.00	15.50	14 1/4	9 1/4	2 7/8	43.00	110.00	21	14 3/8
1 11/32	6.25	16.25	14 3/8	9 3/8	2 15/16	45.50	117.50	21	14 3/8
1 3/8	6.50	17.00	14 1/2	9 1/2	3	48.00	125.00	22	15 3/8

64th sizes to 1 3/8" inclusive take the price of next larger size
Specify our list number when ordering


LINCOLN

High Speed Oil Drills



The diagram of cross section shows the following exclusive features, which are embodied only in the  "Lincoln" High Speed Oil Drill:—

(a) The particularly large oil duct, spirally milled, therefore of uniform size and shape throughout its entire length, carries a continuous supply of oil to the point of the drill, thus producing a perfect tool for

horizontal drilling, or exceptionally deep drilling, as well as for any ordinary drilling job.

(b) Tight fit of oil duct covering insures against possibility of leakage under pressure.

(c) A solid rod inserted in groove for its entire length, leaves practically a hole through solid metal, with no tube to become dented, leak or get caught in the work.

(d) Rod can not possibly become loosened or distorted, owing to the exceptionally large lips of hardened metal protecting it.

(e) These features all combine to produce a particularly long-lived drill. It will hold perfectly to size, not being weakened by the insertion of the conventional oil tube.

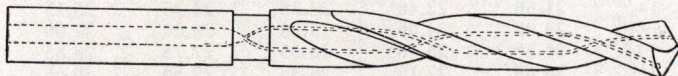


Diagram Showing Side View of Drill with Location of Oil Ducts.

Sizes and Prices on next page.



Straight and Taper Shank Oil Drills



High Speed Steel No. 614

Size	LENGTHS OVERALL				
	9 Inches	9½ Inches	10 Inches	10½ Inches	11 Inches
½	\$6.00	\$6.25	\$6.50	\$6.75	\$7.00
9/16	6.25	6.50	6.75	7.00	7.25
5/8	6.50	6.75	7.00	7.25	7.50
21/32	6.65	6.90	7.15	7.40	7.65
11/16	6.75	7.00	7.25	7.50	7.75
23/32	6.90	7.15	7.45	7.70	7.95
*					
¾	7.00	7.30	7.60	7.85	8.15
25/32	7.25	7.55	7.85	8.10	8.40
13/16	7.50	7.80	8.10	8.35	8.65
27/32	7.90	8.20	8.50	8.75	9.05
7/8	8.25	8.85	9.10	9.10	9.40
29/32	8.65	8.95	9.25	9.50	9.80
15/16	9.00	9.30	9.60	9.85	10.15
31/32	9.40	9.70	10.00	10.25	10.55
1	9.75	10.05	10.35	10.60	10.90
1 1/32	10.15	10.45	10.75	11.05	11.40
1 1/16	10.50	10.85	11.15	11.50	11.85
1 3/32	10.90	11.25	11.60	11.95	12.30
1 1/8	11.25	11.60	12.00	12.35	12.75
1 5/32	11.65	12.05	12.45	12.80	13.20
1 3/16	12.00	12.40	12.85	13.25	13.65
1 7/32	12.40	12.85	13.25	13.70	14.15
1 1/4	12.75	13.20	13.65	14.10	14.60
1 9/32	13.15	13.60	14.10	14.55	15.05
1 5/16	13.50	14.00	14.50	15.00	15.50
1 11/32	13.90	14.40	14.95	15.45	15.95
1 3/8	14.25	14.80	15.35	15.85	16.40
1 13/32	14.75	15.30	15.90	16.45	17.00
1 7/16	15.25	15.85	16.40	17.00	17.60
1 15/32	15.90	16.50	17.10	17.70	18.30
1 1/2	16.50	17.10	17.75	18.35	19.00
1 9/16	17.75	18.40	19.10	19.75	20.40
1 5/8	19.00	19.75	20.50	21.25	22.00
1 11/16	20.25	21.10	21.90	22.75	23.60
1 3/4	21.50	22.40	23.35	24.25	25.15
1 13/16	23.00	24.00	25.00	26.00	27.00
1 7/8	24.50	25.60	26.65	27.75	28.85
1 15/16	26.00	27.15	28.35	29.50	30.65
2	27.50	28.75	30.00	31.25	32.50

Continued on next page

*Oil drills smaller than ¾ inch are made with inserted tube; drills ¾ inch and larger are of the style described on page 223.

Specify our list number when ordering

Straight and Taper Shank Oil Drills



High Speed Steel No. 614

Size	LENGTHS OVERALL				
	11½ Inches	12 Inches	12½ Inches	13 Inches	13½ Inches
1/2	\$7.25	\$7.50	\$7.85	\$8.25	\$8.60
9/16	7.50	7.75	8.10	8.50	8.85
5/8	7.75	8.00	8.35	8.75	9.10
21/32	7.90	8.15	8.55	8.95	9.35
11/16	8.00	8.25	8.70	9.10	9.55
23/32	8.25	8.50	8.95	9.35	9.80
3/4	8.45	8.75	9.20	9.60	10.05
25/32	8.70	9.00	9.45	9.85	10.30
13/16	8.95	9.25	9.70	10.10	10.55
27/32	9.35	9.65	10.10	10.50	10.95
7/8	9.70	10.00	10.45	10.85	11.30
29/32	10.10	10.40	10.85	11.25	11.70
15/16	10.45	10.75	11.20	11.60	12.05
31/32	10.85	11.15	11.60	12.00	12.45
1	11.20	11.50	11.95	12.35	12.80
1 1/32	11.70	12.00	12.45	12.95	13.40
1 1/16	12.15	12.50	13.00	13.50	14.00
1 3/32	12.65	13.00	13.55	14.05	14.60
1 1/8	13.10	13.50	14.05	14.60	15.20
1 5/32	13.60	14.00	14.60	15.20	15.80
1 3/16	14.10	14.50	15.10	15.75	16.35
1 7/32	14.55	15.00	15.65	16.30	17.00
1 1/4	15.05	15.50	16.20	16.85	17.55
1 9/32	15.50	16.00	16.70	17.45	18.15
1 5/16	16.00	16.50	17.25	18.00	18.75
1 11/32	16.50	17.00	17.80	18.55	19.35
1 3/8	16.95	17.50	18.30	19.10	19.95
1 13/32	17.60	18.15	19.00	19.80	20.65
1 7/16	18.15	18.75	19.60	20.50	21.35
1 15/32	18.90	19.50	20.40	21.30	22.25
1 1/2	19.60	20.25	21.20	22.10	23.05
1 9/16	21.10	21.75	22.75	23.75	24.75
1 5/8	22.75	23.50	24.60	25.75	26.85
1 11/16	24.40	25.25	26.50	27.75	29.00
1 3/4	26.10	27.00	28.35	29.75	31.10
1 13/16	28.00	29.00	30.50	32.00	33.50
1 7/8	29.90	31.00	32.60	34.25	35.85
1 15/16	31.85	33.00	34.75	36.50	38.25
2	33.75	35.00	36.85	38.75	40.60

Continued on next page
Specify our list number when ordering



Straight and Taper Shank Oil Drills



High Speed Steel No. 614

Size	LENGTHS OVERALL				
	14 Inches	14½ Inches	15 Inches	15½ Inches	16 Inches
1/2	\$9.00	....	....	....	....
9/16	9.25	....	....	....	....
5/8	9.50	....	....	....	....
21/32	9.75	....	....	....	....
11/16	10.00	....	....	....	....
23/32	10.25	....	....	....	....
3/4	10.50	\$10.95	\$11.35	\$11.80	\$12.25
25/32	10.75	11.20	11.60	12.05	12.50
13/16	11.00	11.45	11.85	12.30	12.75
27/32	11.40	11.85	12.25	12.70	13.15
7/8	11.75	12.20	12.60	13.05	13.50
29/32	12.15	12.60	13.00	13.45	13.90
15/16	12.50	12.95	13.35	13.80	14.25
31/32	12.90	13.35	13.80	14.30	14.75
1	13.25	13.75	14.25	14.75	15.25
1 1/32	13.90	14.40	14.90	15.40	15.90
1 1/16	14.50	15.00	15.50	16.00	16.50
1 3/32	15.15	15.65	16.20	16.70	17.25
1 1/8	15.75	16.30	16.85	17.45	18.00
1 5/32	16.40	17.00	17.55	18.15	18.75
1 3/16	17.00	17.60	18.25	18.85	19.50
1 7/32	17.65	18.30	18.95	19.60	20.25
1 1/4	18.25	18.95	19.60	20.30	21.00
1 9/32	18.90	19.60	20.30	21.05	21.75
1 5/16	19.50	20.25	21.00	21.75	22.50
1 11/32	20.15	20.90	21.70	22.45	23.25
1 3/8	20.75	21.55	22.35	23.20	24.00
1 13/32	21.50	22.35	23.20	24.05	24.90
1 7/16	22.25	23.10	24.00	24.85	25.75
1 15/32	23.15	24.00	24.90	25.75	26.65
1 1/2	24.00	24.85	25.75	26.60	27.50
1 9/16	25.75	26.75	27.75	28.75	29.75
1 5/8	28.00	29.10	30.25	31.35	32.50
1 11/16	30.25	31.50	32.75	34.00	35.25
1 3/4	32.50	33.85	35.25	36.60	38.00
1 13/16	35.00	36.50	38.00	39.50	41.00
1 7/8	37.50	39.10	40.75	42.35	44.00
1 15/16	40.00	41.75	43.50	45.25	47.00
2	42.50	44.35	46.25	48.10	50.00

Continued on next page
Specify our list number when ordering

Straight and Taper Shank Oil Drills



High Speed Steel No. 614

Size	LENGTHS OVERALL			
	16½ Inches	17 Inches	17½ Inches	18 Inches
¾	\$12.70	\$13.10	\$13.55	\$14.00
25/32	12.95	13.35	13.80	14.25
13/16	13.20	13.60	14.05	14.50
27/32	13.60	14.00	14.45	14.90
7/8	13.95	14.35	14.80	15.25
29/32	14.35	14.75	15.20	15.65
15/16	14.70	15.10	15.55	16.00
31/32	15.20	15.70	16.15	16.65
1	15.75	16.25	16.75	17.25
1 1/32	16.40	16.90	17.40	17.90
1 1/16	17.00	17.50	18.00	18.50
1 3/32	17.80	18.30	18.85	19.40
1 7/8	18.55	19.10	19.70	20.25
1 5/32	19.35	19.95	20.55	21.15
1 9/16	20.10	20.75	21.35	22.00
1 7/32	20.90	21.55	22.25	22.90
1 1/4	21.70	22.35	23.05	23.75
1 9/32	22.50	23.20	23.95	24.65
1 5/16	23.25	24.00	24.75	25.50
1 11/32	24.05	24.80	25.60	27.25
1 13/32	25.75	26.55	27.40	28.25
1 7/16	26.60	27.50	28.35	29.25
1 15/32	27.55	28.45	29.35	30.25
1 1/2	28.45	29.35	30.30	31.25
1 9/16	30.75	31.75	32.75	33.75
1 5/8	33.60	34.75	35.85	37.00
1 11/16	36.50	37.75	39.00	40.25
1 3/4	39.35	40.75	42.10	43.50
1 13/16	42.50	44.00	45.50	47.00
1 7/8	45.60	47.25	48.85	50.50
1 15/16	48.75	50.50	52.25	54.00
2	51.85	53.75	55.60	57.50

All sizes and dimensions not listed are special and subject to special prices.

Specify our list number when ordering



Bit Stock Drills for Metal or Wood



Carbon Steel No. 109

Diameter	Price per Dozen	Length Overall	Length of Twist	Diameter	Price per Dozen	Length Overall	Length of Twist
$\frac{1}{16}$	\$2.50	$3\frac{5}{16}$	$\frac{7}{8}$	$\frac{15}{32}$	\$11.75	$6\frac{3}{4}$	$4\frac{1}{2}$
$\frac{5}{64}$	2.60	$3\frac{7}{16}$	$1\frac{1}{8}$	$\frac{1}{2}$	13.00	7	$4\frac{3}{4}$
$\frac{3}{32}$	2.70	$3\frac{9}{16}$	$1\frac{1}{4}$	$\frac{17}{32}$	14.25	$7\frac{1}{4}$	5
$\frac{7}{64}$	2.85	$3\frac{11}{16}$	$1\frac{1}{2}$	$\frac{9}{16}$	15.50	$7\frac{1}{2}$	5
$\frac{1}{8}$	3.00	$3\frac{13}{16}$	$1\frac{3}{4}$	$\frac{19}{32}$	16.75	$7\frac{1}{2}$	5
$\frac{9}{64}$	3.25	$3\frac{15}{16}$	$1\frac{7}{8}$	$\frac{5}{8}$	18.00	$7\frac{1}{2}$	5
$\frac{5}{32}$	3.50	$4\frac{1}{16}$	2	$\frac{21}{32}$	19.50	$7\frac{1}{2}$	5
$\frac{11}{64}$	3.75	$4\frac{3}{16}$	$2\frac{1}{8}$	$\frac{11}{16}$	21.00	$7\frac{1}{2}$	5
$\frac{3}{16}$	4.00	$4\frac{5}{16}$	$2\frac{1}{4}$	$\frac{23}{32}$	22.50	$7\frac{1}{2}$	5
$\frac{13}{64}$	4.25	$4\frac{3}{4}$	$2\frac{3}{4}$	$\frac{3}{4}$	24.00	$7\frac{1}{2}$	5
$\frac{7}{32}$	4.50	$4\frac{3}{4}$	$2\frac{3}{4}$	$\frac{25}{32}$	25.50	$7\frac{1}{2}$	5
$\frac{15}{64}$	4.75	5	$2\frac{7}{8}$	$\frac{13}{16}$	27.00	$7\frac{1}{2}$	5
$\frac{1}{4}$	5.00	5	$2\frac{7}{8}$	$\frac{27}{32}$	28.50	$7\frac{1}{2}$	5
$\frac{17}{64}$	5.50	$5\frac{1}{4}$	3	$\frac{7}{8}$	30.00	$7\frac{1}{2}$	5
$\frac{9}{32}$	6.00	$5\frac{1}{4}$	3	$\frac{29}{32}$	31.50	$7\frac{1}{2}$	5
$\frac{19}{64}$	6.50	$5\frac{1}{2}$	$3\frac{1}{4}$	$\frac{15}{16}$	33.00	$7\frac{1}{2}$	5
$\frac{5}{16}$	7.00	$5\frac{1}{2}$	$3\frac{1}{4}$	$\frac{31}{32}$	34.50	$7\frac{1}{2}$	5
$\frac{21}{64}$	7.50	$5\frac{3}{4}$	$3\frac{1}{2}$	1	36.00	$7\frac{1}{2}$	5
$\frac{11}{32}$	8.00	$5\frac{3}{4}$	$3\frac{1}{2}$	$\frac{11}{16}$	39.00	$7\frac{1}{2}$	5
$\frac{3}{8}$	8.50	6	$3\frac{3}{4}$	$1\frac{1}{8}$	42.00	$7\frac{1}{2}$	5
$\frac{13}{32}$	9.25	$6\frac{1}{4}$	4	$\frac{13}{16}$	45.00	$7\frac{1}{2}$	5
$\frac{7}{16}$	10.50	$6\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{1}{4}$	48.00	$7\frac{1}{2}$	5

Our Bit Stock Drills will fit any brace on the market. They are intended principally for wood boring, but can be used to drill iron or other metals. They are not injured by contact with screws or nails, and will bore straight any kind of wood without splitting it.

For Sets of Bit Stock Drills, see page 245.

Specify our list number when ordering

Straight Shank Drills for Wood



Carbon Steel No. 165

Diameter	Price per Dozen	Length Overall	Length of Twist
$\frac{1}{16}$	\$1.60	$2\frac{1}{2}$	$1\frac{1}{4}$
$\frac{3}{32}$	1.70	$2\frac{3}{4}$	$1\frac{1}{2}$
$\frac{1}{8}$	1.80	3	$1\frac{13}{16}$
$\frac{5}{32}$	1.90	$3\frac{1}{4}$	$2\frac{3}{32}$
$\frac{3}{16}$	2.25	$3\frac{1}{2}$	$2\frac{5}{16}$
$\frac{7}{32}$	2.75	$3\frac{3}{4}$	$2\frac{17}{32}$
$\frac{1}{4}$	3.25	4	$2\frac{3}{4}$
$\frac{9}{32}$	3.80	$4\frac{1}{4}$	$2\frac{31}{32}$
$\frac{5}{16}$	4.35	$4\frac{1}{2}$	$3\frac{3}{16}$
$1\frac{1}{32}$	5.05	$4\frac{3}{4}$	$3\frac{13}{32}$
$\frac{3}{8}$	6.00	5	$3\frac{5}{8}$
$1\frac{3}{32}$	7.00	$5\frac{1}{4}$	$3\frac{27}{32}$
$\frac{7}{16}$	8.50	$5\frac{1}{2}$	$4\frac{1}{16}$
$1\frac{5}{32}$	10.00	$5\frac{3}{4}$	$4\frac{9}{32}$
$\frac{1}{2}$	12.00	6	$4\frac{1}{2}$
$1\frac{7}{32}$	12.50	6	$4\frac{1}{2}$
$\frac{9}{16}$	13.00	6	$4\frac{1}{2}$
$1\frac{9}{32}$	13.50	6	$4\frac{1}{2}$
$\frac{5}{8}$	14.00	6	$4\frac{1}{2}$

Specify our list number when ordering



Machine Bits for Wood

With Taper Shanks



Carbon Steel No. 162

Diameter	Price Each	Length Overall	Length of Twist	Taper Shank	Diameter	Price Each	Length Overall	Length of Twist	Taper Shank
$\frac{1}{8}$	\$0.50	$4\frac{5}{8}$	$1\frac{13}{16}$	No. 1	$2\frac{3}{32}$	\$1.90	$9\frac{1}{2}$	$5\frac{11}{16}$	No. 2
$\frac{5}{32}$	.55	$4\frac{7}{8}$	$2\frac{3}{32}$		$\frac{3}{4}$	2.00	$9\frac{3}{4}$	$5\frac{15}{16}$
$\frac{3}{16}$	.60	5	$2\frac{5}{16}$		$2\frac{5}{32}$	2.10	$9\frac{7}{8}$	$6\frac{1}{16}$
$\frac{7}{32}$	.65	$5\frac{1}{4}$	$2\frac{17}{32}$		$\frac{13}{16}$	2.20	10	$6\frac{3}{16}$
$\frac{1}{4}$	.70	$6\frac{1}{8}$	3		$2\frac{7}{32}$	2.40	$10\frac{1}{4}$	$6\frac{7}{16}$
$\frac{9}{32}$	.75	$6\frac{1}{4}$	$2\frac{15}{16}$		$\frac{7}{8}$	2.60	$10\frac{1}{2}$	$6\frac{11}{16}$
$\frac{5}{16}$.80	$6\frac{3}{8}$	$3\frac{1}{16}$		$2\frac{9}{32}$	2.80	$10\frac{5}{8}$	$6\frac{13}{16}$	No. 3
$1\frac{1}{32}$	.85	$6\frac{1}{2}$	$3\frac{3}{16}$		$\frac{15}{16}$	3.00	$10\frac{3}{4}$	$6\frac{1}{4}$
$\frac{3}{8}$	.90	$6\frac{3}{4}$	$3\frac{7}{16}$		$3\frac{1}{32}$	3.25	$10\frac{7}{8}$	$6\frac{3}{8}$
$1\frac{3}{32}$	.95	7	$3\frac{11}{16}$		1	3.50	11	$6\frac{1}{2}$
$\frac{7}{16}$	1.00	$7\frac{1}{4}$	$3\frac{15}{16}$		$1\frac{1}{16}$	4.00	$11\frac{1}{4}$	$6\frac{3}{4}$	
$1\frac{5}{32}$	1.10	$7\frac{1}{2}$	$4\frac{3}{16}$		$1\frac{1}{8}$	4.50	$11\frac{3}{4}$	$7\frac{1}{4}$	
$\frac{1}{2}$	1.20	$7\frac{3}{4}$	$4\frac{7}{16}$	No. 2	$1\frac{3}{16}$	5.00	12	$7\frac{1}{2}$	No. 4
$1\frac{7}{32}$	1.30	8	$4\frac{11}{16}$		$1\frac{1}{4}$	5.50	$12\frac{1}{2}$	8	
$\frac{9}{16}$	1.40	$8\frac{1}{4}$	$4\frac{15}{16}$		$1\frac{5}{16}$	6.00	$14\frac{1}{4}$	$8\frac{3}{4}$	
$1\frac{9}{32}$	1.50	$8\frac{1}{2}$	$4\frac{5}{8}$		$1\frac{3}{8}$	6.50	$14\frac{1}{2}$	9	
$\frac{5}{8}$	1.60	$8\frac{3}{4}$	$4\frac{15}{16}$		$1\frac{7}{16}$	7.50	$14\frac{3}{4}$	$9\frac{1}{4}$	
$2\frac{1}{32}$	1.70	9	$5\frac{3}{16}$		$1\frac{1}{2}$	8.50	15	$9\frac{1}{2}$	
$1\frac{11}{16}$	1.80	$9\frac{1}{4}$	$5\frac{7}{16}$						

Specify our list number when ordering

Machine Bits for Wood

With Straight Shanks



Carbon Steel No. 164

Diameter	Price Each	Length Overall	Length of Twist	Diameter	Price Each	Length Overall	Length of Twist
$\frac{1}{8}$	\$0.40	3	$1\frac{13}{16}$	$2\frac{3}{32}$	\$1.80	$7\frac{1}{4}$	$5\frac{1}{2}$
$\frac{5}{32}$	.45	$3\frac{1}{4}$	$2\frac{3}{32}$	$\frac{3}{4}$	1.90	$7\frac{1}{2}$	$5\frac{11}{16}$
$\frac{3}{16}$	.50	$3\frac{1}{2}$	$2\frac{5}{16}$	$2\frac{5}{32}$	2.00	$7\frac{3}{4}$	$5\frac{7}{8}$
$\frac{7}{32}$	.55	$3\frac{3}{4}$	$2\frac{17}{32}$	$\frac{13}{16}$	2.10	8	$6\frac{1}{16}$
$\frac{1}{4}$	.60	4	$2\frac{3}{4}$	$2\frac{7}{32}$	2.30	$8\frac{1}{4}$	$6\frac{1}{4}$
$\frac{9}{32}$	.65	$4\frac{1}{4}$	$2\frac{31}{32}$	$\frac{7}{8}$	2.50	$8\frac{1}{2}$	$6\frac{7}{16}$
$\frac{5}{16}$	.70	$4\frac{1}{2}$	$3\frac{3}{16}$	$2\frac{9}{32}$	2.70	$8\frac{3}{4}$	$6\frac{5}{8}$
$1\frac{1}{32}$	.75	$4\frac{3}{4}$	$3\frac{13}{32}$	$\frac{15}{16}$	2.90	9	$6\frac{13}{16}$
$\frac{3}{8}$	.80	5	$3\frac{5}{8}$	$3\frac{1}{32}$	3.00	$9\frac{1}{4}$	7
$1\frac{3}{32}$	.85	$5\frac{1}{4}$	$3\frac{27}{32}$	1	3.25	$9\frac{1}{2}$	$7\frac{3}{16}$
$\frac{7}{16}$	.90	$5\frac{1}{2}$	$4\frac{1}{16}$	$1\frac{1}{16}$	3.75	$11\frac{1}{4}$	$8\frac{1}{2}$
$1\frac{5}{32}$	1.00	$5\frac{3}{4}$	$4\frac{9}{32}$	$1\frac{1}{8}$	4.25	$11\frac{3}{4}$	$8\frac{7}{8}$
$\frac{1}{2}$	1.10	6	$4\frac{1}{2}$	$1\frac{3}{16}$	4.75	12	9
$1\frac{7}{32}$	1.20	$6\frac{1}{8}$	$4\frac{19}{32}$	$1\frac{1}{4}$	5.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{9}{16}$	1.30	$6\frac{1}{4}$	$4\frac{11}{16}$	$1\frac{5}{16}$	5.75	$12\frac{1}{2}$	$9\frac{3}{8}$
$1\frac{9}{32}$	1.40	$6\frac{3}{8}$	$4\frac{3}{4}$	$1\frac{3}{8}$	6.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$\frac{5}{8}$	1.50	$6\frac{1}{2}$	$4\frac{7}{8}$	$1\frac{7}{16}$	7.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$2\frac{1}{32}$	1.60	$6\frac{3}{4}$	5	$1\frac{1}{2}$	8.25	$12\frac{1}{2}$	$9\frac{3}{8}$
$1\frac{1}{16}$	1.70	7	$5\frac{5}{16}$				

Specify our list number when ordering



Machine Bits for Wood

Shanks $\frac{1}{2}$ " diameter x $2\frac{1}{2}$ " long
Fitting Blacksmiths' Drill Presses



Carbon Steel No. 267

Diam-eter	Price Each	Length Overall	Length of Twist	Diam-eter	Price Each	Length Overall	Length of Twist
$\frac{1}{8}$	\$0.50.	$4\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{3}{32}$	\$1.90	$9\frac{1}{2}$	$6\frac{1}{4}$
$\frac{5}{32}$	.55	$4\frac{7}{8}$	$2\frac{3}{32}$	$\frac{3}{4}$	2.00	$9\frac{3}{4}$	$6\frac{1}{2}$
$\frac{3}{16}$	.60	5	$2\frac{5}{16}$	$2\frac{5}{32}$	2.10	$9\frac{7}{8}$	$6\frac{5}{8}$
$\frac{7}{32}$	.65	$5\frac{1}{4}$	$2\frac{17}{32}$	$\frac{13}{16}$	2.20	10	$6\frac{3}{4}$
$\frac{1}{4}$	.70	$6\frac{1}{8}$	3	$2\frac{7}{32}$	2.40	$10\frac{1}{4}$	7
$\frac{9}{32}$	.75	$6\frac{1}{4}$	3	$\frac{7}{8}$	2.60	$10\frac{1}{2}$	$7\frac{1}{4}$
$\frac{5}{16}$	.80	$6\frac{3}{8}$	$3\frac{1}{8}$	$2\frac{9}{32}$	2.80	$10\frac{5}{8}$	$7\frac{3}{8}$
$1\frac{1}{32}$	.85	$6\frac{1}{2}$	$3\frac{1}{4}$	$\frac{15}{16}$	3.00	$10\frac{3}{4}$	$7\frac{1}{2}$
$\frac{3}{8}$	.90	$6\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{1}{32}$	3.25	$10\frac{7}{8}$	$7\frac{5}{8}$
$1\frac{3}{32}$	.95	7	$3\frac{3}{4}$	1	3.50	11	$7\frac{3}{8}$
$\frac{7}{16}$	1.00	$7\frac{1}{4}$	4	$1\frac{1}{16}$	4.00	$11\frac{1}{4}$	$7\frac{5}{8}$
$1\frac{5}{32}$	1.10	$7\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{1}{8}$	4.50	$11\frac{3}{4}$	8
$\frac{1}{2}$	1.20	$7\frac{3}{4}$	$4\frac{1}{2}$	$1\frac{3}{16}$	5.00	12	$8\frac{1}{4}$
$1\frac{7}{32}$	1.30	8	$4\frac{3}{4}$	$1\frac{1}{4}$	5.50	$12\frac{1}{2}$	$8\frac{5}{8}$
$\frac{9}{16}$	1.40	$8\frac{1}{4}$	5	$1\frac{5}{16}$	6.00	$12\frac{1}{2}$	$8\frac{5}{8}$
$1\frac{9}{32}$	1.50	$8\frac{1}{2}$	$5\frac{1}{4}$	$1\frac{3}{8}$	6.50	$12\frac{1}{2}$	$8\frac{1}{2}$
$\frac{5}{8}$	1.60	$8\frac{3}{4}$	$5\frac{1}{2}$	$1\frac{7}{16}$	7.50	$12\frac{1}{2}$	$8\frac{1}{2}$
$2\frac{1}{32}$	1.70	9	$5\frac{3}{4}$	$1\frac{1}{2}$	8.50	$12\frac{1}{2}$	$8\frac{3}{8}$
$1\frac{1}{16}$	1.80	$9\frac{1}{4}$	6				

Specify our list number when ordering

Millimeter Sizes Twist Drills

With Taper Shanks



Carbon Steel No. 122

High Speed Steel No. 622

Diameter MM.	Price Each		Dec. Diam. Inches	Length Overall MM.	Taper Shank	Diameter MM.	Price Each		Dec. Diam. Inches	Length Overall MM.	Taper Shank
	Carbon Steel	High Speed					Carbon Steel	High Speed			
3	\$0.45	\$0.90	.1181	130	No. 1	21½	\$2.60	\$4.75	.8464	260	No. 2
3½	.45	.90	.1378	133		22	2.60	4.75	.8661	267	
4	.50	.90	.1575	140		22½	2.80	5.15	.8858	267	
4½	.50	.90	.1771	146		23	2.80	5.15	.9055	270	
5	.55	1.00	.1968	149		23½	3.00	5.50	.9252	270	No. 3
5½	.55	1.00	.2165	149		24	3.25	5.90	.9449	276	
6	.60	1.10	.2362	155		24½	3.25	5.90	.9646	276	
6½	.65	1.20	.2559	155		25	3.50	6.25	.9843	279	
7	.65	1.20	.2756	159		25½	3.75	6.75	1.0039	279	
7½	.70	1.30	.2953	159		26	3.75	6.75	1.0236	282	
8	.75	1.40	.3149	162		26½	4.00	7.25	1.0433	282	
8½	.75	1.40	.3346	162		27	4.25	7.75	1.0629	286	
9	.80	1.50	.3543	172		27½	4.25	7.75	1.0827	286	
9½	.80	1.50	.3740	172		28	4.50	8.25	1.1024	298	
10	.90	1.65	.3937	178	No. 2	28½	4.50	8.25	1.1220	298	No. 3
10½	1.00	1.75	.4134	178		29	4.75	8.90	1.1417	302	
11	1.00	1.75	.4330	184		29½	5.00	9.50	1.1614	302	
11½	1.10	1.90	.4527	184		30	5.00	9.50	1.1811	305	
12	1.20	2.00	.4724	191		30½	5.25	10.15	1.2008	305	No. 4
12½	1.20	2.00	.4921	197		31	5.50	10.75	1.2205	308	
13	1.30	2.15	.5118	203		31½	5.50	10.75	1.2401	308	
13½	1.40	2.25	.5315	203		32	5.75	11.50	1.2598	317	
14	1.40	2.25	.5512	210		32½	5.75	11.50	1.2795	359	
14½	1.50	2.40	.5708	216		33	6.00	12.25	1.2992	362	
15	1.50	2.40	.5905	216		33½	6.25	13.00	1.3190	362	
15½	1.60	2.50	.6102	216		34	6.25	13.00	1.3386	365	
16	1.70	2.75	.6299	222		34½	6.50	13.75	1.3583	365	
16½	1.70	2.75	.6496	222	No. 2	35	7.00	14.65	1.3779	368	
17	1.80	3.00	.6693	235		35½	7.00	14.65	1.3977	368	
17½	1.90	3.25	.6890	235		36	7.50	15.50	1.4173	375	
18	1.90	3.25	.7086	241		36½	7.50	15.50	1.4370	375	
18½	2.00	3.50	.7283	241		37	8.00	16.40	1.4567	378	
19	2.00	3.50	.7480	247		37½	8.50	17.25	1.4764	378	
19½	2.10	3.75	.7677	247		38	8.50	17.25	1.4961	381	
20	2.20	4.00	.7874	254		38½	9.00	18.15	1.5157	381	
20½	2.20	4.00	.8071	254		39	9.50	19.00	1.5354	384	
21	2.40	4.40	.8267	260		39½	9.50	19.00	1.5551	384	

Continued on next page
Specify our list number when ordering



Millimeter Sizes Twist Drills

With Taper Shanks



Carbon Steel No. 122

High Speed Steel No. 622

Diameter	Price Each		Dec- imal Diam.	Length Overall	Taper Shank	Diam- eter	Price Each		Dec- imal Diam.	Length Overall	Taper Shank
	Car- bon Steel	High Speed					Car- bon Steel	High Speed			
40	\$10.00	\$20.00	1.5748	390	No. 4	58	\$26.00	\$50.00	2.2835	445	No. 5
40½	10.50	21.00	1.5945	390		58½	26.00	50.00	2.3031	445	
41	10.50	21.00	1.6142	394		59	26.75	52.50	2.3228	457	
41½	11.00	22.00	1.6338	394		59½	26.75	52.50	2.3425	457	
42	11.00	22.00	1.6536	397		60	27.50	55.00	2.3622	457	
42½	11.50	23.00	1.6733	397		60½	28.25	57.50	2.3819	457	
43	12.00	24.00	1.6929	400		61	28.25	57.50	2.4015	470	
43½	12.00	24.00	1.7126	400		61½	29.00	60.00	2.4212	470	
44	12.50	25.00	1.7323	406		62	29.75	62.50	2.4409	483	
44½	13.25	26.25	1.7519	406		62½	29.75	62.50	2.4606	483	
45	13.25	26.25	1.7717	409		63	30.50	65.00	2.4803	483	
45½	14.00	27.50	1.7914	409		63½	30.50	65.00	2.5000	483	
46	14.00	27.50	1.8110	409		64	31.25	67.50	2.5197	483	
46½	14.75	28.75	1.8307	409		64½	32.00	70.00	2.5393	483	
47	15.50	30.00	1.8504	419		65	32.00	70.00	2.5591	489	
47½	15.50	30.00	1.8701	419		65½	33.00	72.50	2.5787	489	
48	16.25	31.25	1.8898	419		66	34.00	75.00	2.5984	495	
48½	17.00	32.50	1.9094	419		66½	34.00	75.00	2.6181	495	
49	17.00	32.50	1.9291	419		67	35.00	77.50	2.6378	495	
49½	17.75	33.75	1.9488	419		67½	36.00	80.00	2.6574	495	
50	17.75	33.75	1.9685	428		68	36.00	80.00	2.6772	508	
50½	18.50	35.00	1.9882	428		68½	37.00	82.50	2.6969	508	
51	19.25	36.25	2.0079	428	No. 5	69	37.00	82.50	2.7165	521	
51½	19.25	36.25	2.0276	428		69½	38.00	85.00	2.7362	521	
52	20.00	37.50	2.0473	435		70	39.25	87.50	2.7559	521	
52½	20.75	38.75	2.0670	435		70½	39.25	87.50	2.7756	521	
53	20.75	38.75	2.0866	435		71	40.50	90.00	2.7952	521	
53½	21.50	40.00	2.1063	435		71½	41.75	92.50	2.8149	521	
54	22.25	41.25	2.1259	445		72	41.75	92.50	2.8347	521	
54½	22.25	41.25	2.1456	445		72½	43.00	95.00	2.8543	521	
55	23.00	42.50	2.1654	445		73	43.00	95.00	2.8740	533	
55½	23.00	42.50	2.1851	445		73½	44.25	97.50	2.8937	533	
56	23.75	43.75	2.2047	445		74	45.50	100.00	2.9134	533	
56½	24.50	45.00	2.2244	445		74½	45.50	100.00	2.9330	533	
57	24.50	45.00	2.2441	445		75	46.75	102.50	2.9527	533	
57½	25.25	47.50	2.2637	445		75½	48.00	105.00	2.9724	533	
						76	48.00	105.00	2.9921	559	

Specify our list number when ordering

Millimeter Sizes Twist Drills

Straight Shanks—Taper Shank Lengths



Carbon Steel No. 124

High Speed Steel No. 624

Diameter	Price Each		Decimal Diameter	Length Overall	Diameter	Price Each		Decimal Diameter	Length Overall
	Carbon Steel	High Speed				Carbon Steel	High Speed		
3	\$0.45	\$0.90	.1181	130	21 1/2	\$2.60	\$4.75	.8464	260
3 1/2	.45	.90	.1378	133	22	2.60	4.75	.8661	267
4	.50	.90	.1575	140	22 1/2	2.80	5.15	.8858	267
4 1/2	.50	.90	.1771	146	23	2.80	5.15	.9055	270
5	.55	1.00	.1968	149	23 1/2	3.00	5.50	.9252	270
5 1/2	.55	1.00	.2165	149	24	3.25	5.90	.9449	276
6	.60	1.10	.2362	155	24 1/2	3.25	5.90	.9646	276
6 1/2	.65	1.20	.2559	155	25	3.50	6.25	.9842	279
7	.65	1.20	.2756	159	25 1/2	3.75	6.75	1.0039	279
7 1/2	.70	1.30	.2953	159	26	3.75	6.75	1.0236	282
8	.75	1.40	.3149	162	26 1/2	4.00	7.25	1.0433	282
8 1/2	.75	1.40	.3346	162	27	4.25	7.75	1.0629	286
9	.80	1.50	.3543	172	27 1/2	4.25	7.75	1.0827	286
9 1/2	.80	1.50	.3740	172	28	4.50	8.25	1.1024	298
10	.90	1.65	.3937	178	28 1/2	4.50	8.25	1.1220	298
10 1/2	1.00	1.75	.4134	178	29	4.75	8.90	1.1417	302
11	1.00	1.75	.4330	184	29 1/2	5.00	9.50	1.1614	302
11 1/2	1.10	1.90	.4527	184	30	5.00	9.50	1.1811	305
12	1.20	2.00	.4724	191	30 1/2	5.25	10.15	1.2008	305
12 1/2	1.20	2.00	.4921	197	31	5.50	10.75	1.2205	308
13	1.30	2.15	.5118	203	31 1/2	5.50	10.75	1.2401	308
13 1/2	1.40	2.25	.5315	203	32	5.75	11.50	1.2598	317
14	1.40	2.25	.5512	210	32 1/2	5.75	11.50	1.2795	359
14 1/2	1.50	2.40	.5708	216	33	6.00	12.25	1.2992	362
15	1.50	2.40	.5905	216	33 1/2	6.25	13.00	1.3190	362
15 1/2	1.60	2.50	.6102	216	34	6.25	13.00	1.3386	365
16	1.70	2.75	.6299	222	34 1/2	6.50	13.75	1.3583	365
16 1/2	1.70	2.75	.6496	222	35	7.00	14.65	1.3779	368
17	1.80	3.00	.6693	235	35 1/2	7.00	14.65	1.3977	368
17 1/2	1.90	3.25	.6890	235	36	7.50	15.50	1.4173	375
18	1.90	3.25	.7086	241	36 1/2	7.50	15.50	1.4370	375
18 1/2	2.00	3.50	.7283	241	37	8.00	16.40	1.4567	378
19	2.00	3.50	.7480	247	37 1/2	8.50	17.25	1.4764	378
19 1/2	2.10	3.75	.7677	247	38	8.50	17.25	1.4961	381
20	2.20	4.00	.7874	254	38 1/2	9.00	18.15	1.5157	381
20 1/2	2.20	4.00	.8071	254	39	9.50	19.00	1.5354	384
21	2.40	4.40	.8267	260	39 1/2	9.50	19.00	1.5551	384

Continued on next page
Specify our list number when ordering



Millimeter Sizes Twist Drills

Straight Shanks—Taper Shank Lengths



Carbon Steel No. 124

High Speed Steel No. 624

Diameter	Price Each		Decimal Diameter	Length Overall	Diameter	Price Each		Decimal Diameter	Length Overall
	Carbon Steel	High Speed				Carbon Steel	High Speed		
40	\$10.00	\$20.00	1.5748	390	58 1/2	\$26.00	\$50.00	2.3031	445
40 1/2	10.50	21.00	1.5945	390	59	26.75	52.50	2.3228	457
41	10.50	21.00	1.6142	394	59 1/2	26.75	52.50	2.3425	457
41 1/2	11.00	22.00	1.6338	394	60	27.50	55.00	2.3622	457
42	11.00	22.00	1.6536	397	60 1/2	28.25	57.50	2.3819	457
42 1/2	11.50	23.00	1.6733	397	61	28.25	57.50	2.4015	470
43	12.00	24.00	1.6929	400	61 1/2	29.00	60.00	2.4212	470
43 1/2	12.00	24.00	1.7126	400	62	29.75	62.50	2.4409	483
44	12.50	25.00	1.7323	406	62 1/2	29.75	62.50	2.4606	483
44 1/2	13.25	26.25	1.7519	406	63	30.50	65.00	2.4803	483
45	13.25	26.25	1.7717	409	63 1/2	30.50	65.00	2.5000	483
45 1/2	14.00	27.50	1.7914	409	64	31.25	67.50	2.5197	483
46	14.00	27.50	1.8110	409	64 1/2	32.00	70.00	2.5393	483
46 1/2	14.75	28.75	1.8307	409	65	32.00	70.00	2.5591	489
47	15.50	30.00	1.8504	419	65 1/2	33.00	72.50	2.5787	489
47 1/2	15.50	30.00	1.8701	419	66	34.00	75.00	2.5984	495
48	16.25	31.25	1.8898	419	66 1/2	34.00	75.00	2.6181	495
48 1/2	17.00	32.50	1.9094	419	67	35.00	77.50	2.6378	495
49	17.00	32.50	1.9291	419	67 1/2	36.00	80.00	2.6574	495
49 1/2	17.75	33.75	1.9488	419	68	36.00	80.00	2.6772	508
50	17.75	33.75	1.9685	428	68 1/2	37.00	82.50	2.6969	508
50 1/2	18.50	35.00	1.9882	428	69	37.00	82.50	2.7165	521
51	19.25	36.25	2.0079	428	69 1/2	38.00	85.00	2.7362	521
51 1/2	19.25	36.25	2.0276	428	70	39.25	87.50	2.7559	521
52	20.00	37.50	2.0473	435	70 1/2	39.25	87.50	2.7756	521
52 1/2	20.75	38.75	2.0670	435	71	40.50	90.00	2.7952	521
53	20.75	38.75	2.0866	435	71 1/2	41.75	92.50	2.8149	521
53 1/2	21.50	40.00	2.1063	435	72	41.75	92.50	2.8347	521
54	22.25	41.25	2.1259	445	72 1/2	43.00	95.00	2.8543	521
54 1/2	22.25	41.25	2.1456	445	73	43.00	95.00	2.8740	533
55	23.00	42.50	2.1654	445	73 1/2	44.25	97.50	2.8937	533
55 1/2	23.00	42.50	2.1851	445	74	45.50	100.00	2.9134	533
56	23.75	43.75	2.2047	445	74 1/2	45.50	100.00	2.9330	533
56 1/2	24.50	45.00	2.2244	445	75	46.75	102.50	2.9527	533
57	24.50	45.00	2.2441	445	75 1/2	48.00	105.00	2.9724	533
57 1/2	25.25	47.50	2.2637	445	76	48.00	105.00	2.9921	559
58	26.00	50.00	2.2835	445					

Specify our list number when ordering

Millimeter Sizes Twist Drills

Straight Shanks—Short Lengths



Carbon Steel No. 125

High Speed Steel No. 625

Diameter	Price per Dozen		Decimal Diameter	Length Overall	Diameter	Price per Dozen		Decimal Diameter	Length Overall
	Carbon Steel	High Speed				Carbon Steel	High Speed		
.5	\$1.50	....	.0197	22	3.	\$1.75	\$5.90	.1181	70
.6	1.50	....	.0236	27	3.1	1.80	5.90	.1220	70
.7	1.50	....	.0276	32	3.2	1.80	6.10	.1260	71
.75	1.50	....	.0296	35	3.25	1.80	6.10	.1279	72 1/2
.8	1.50	....	.0315	35	3.3	1.80	6.10	.1299	72 1/2
.9	1.50	....	.0354	38	3.4	1.80	6.10	.1339	74
1.	1.50	\$5.70	.0394	40	3.5	1.80	6.10	.1378	76
1.1	1.55	5.70	.0433	41	3.6	1.90	6.10	.1417	76
1.2	1.55	5.70	.0472	43	3.7	1.90	6.10	.1457	77 1/2
1.25	1.55	5.70	.0492	45	3.75	1.90	6.10	.1476	79
1.3	1.60	5.70	.0512	45	3.8	1.90	6.10	.1496	79
1.4	1.60	5.70	.0551	46	3.9	1.90	6.10	.1535	81
1.5	1.60	5.70	.0591	48	4.	1.90	6.10	.1575	82
1.6	1.60	5.70	.0630	49	4.1	2.00	6.30	.1614	84
1.7	1.60	5.70	.0669	50 1/2	4.2	2.00	6.30	.1653	86
1.75	1.60	5.70	.0689	51 1/2	4.25	2.00	6.30	.1673	87
1.8	1.65	5.70	.0709	51 1/2	4.3	2.00	6.30	.1693	87
1.9	1.65	5.70	.0748	54	4.4	2.00	6.30	.1732	89
2.	1.65	5.70	.0787	55	4.5	2.00	6.30	.1772	90
2.1	1.70	5.70	.0827	56	4.6	2.25	6.30	.1811	90
2.2	1.70	5.70	.0866	57	4.7	2.25	6.30	.1850	91
2.25	1.70	5.70	.0886	59	4.75	2.25	6.30	.1870	93
2.3	1.70	5.70	.0905	59	4.8	2.25	6.30	.1890	93
2.4	1.70	5.70	.0945	60	4.9	2.25	7.00	.1929	95
2.5	1.70	5.90	.0984	62	5.	2.25	7.00	.1968	97
2.6	1.75	5.90	.1024	63	5.1	2.60	7.00	.2008	97
2.7	1.75	5.90	.1063	65	5.2	2.60	7.00	.2047	97
2.75	1.75	5.90	.1082	67	5.25	2.60	7.00	.2067	97
2.8	1.75	5.90	.1102	67	5.3	2.60	7.00	.2087	97
2.9	1.75	5.90	.1142	68	5.4	2.60	7.00	.2126	98

Continued on next page
Specify our list number when ordering



Millimeter Sizes Twist Drills

Straight Shanks—Short Lengths



Carbon Steel No. 125

High Speed Steel No. 625

Diameter	Price per Dozen		Decimal Diameter	Length Overall	Diameter	Price per Dozen		Decimal Diameter	Length Overall
	Carbon Steel	High Speed				Carbon Steel	High Speed		
5.5	\$2.60	\$7.00	.2165	98	8.1	\$5.00	\$12.00	.3189	121
5.6	2.95	7.00	.2205	98	8.2	5.00	12.00	.3228	121
5.7	2.95	7.00	.2244	101	8.25	5.00	12.00	.3248	121
5.75	2.95	7.00	.2263	102	8.3	5.00	12.00	.3268	121
5.8	2.95	7.00	.2283	102	8.4	5.00	12.00	.3307	122
5.9	2.95	7.00	.2323	103	8.5	5.00	12.00	.3346	122
6.	2.95	7.35	.2362	105	8.6	5.50	12.00	.3386	124
6.1	3.30	7.35	.2402	105	8.7	5.50	12.00	.3425	124
6.2	3.30	7.35	.2441	105	8.75	5.50	13.50	.3445	125
6.25	3.30	7.35	.2461	105	8.8	5.50	13.50	.3465	125
6.3	3.30	7.35	.2480	105	8.9	5.50	13.50	.3504	125
6.4	3.30	9.10	.2520	105	9.	5.50	13.50	.3543	127
6.5	3.30	9.10	.2559	105	9.1	6.00	13.50	.3583	127
6.6	3.65	9.10	.2598	106	9.2	6.00	13.50	.3622	129
6.7	3.65	9.10	.2638	108	9.25	6.00	13.50	.3642	129
6.75	3.65	9.10	.2657	109	9.3	6.00	13.50	.3661	129
6.8	3.65	9.10	.2677	109	9.4	6.00	13.50	.3701	130
6.9	3.65	9.10	.2716	109	9.5	6.00	13.50	.3740	132
7.	3.65	9.10	.2756	111	9.6	6.50	15.00	.3779	132
7.1	4.00	9.10	.2795	111	9.7	6.50	15.00	.3819	133
7.2	4.00	10.50	.2835	113	9.75	6.50	15.00	.3839	133
7.25	4.00	10.50	.2854	113	9.8	6.50	15.00	.3858	133
7.3	4.00	10.50	.2874	113	9.9	6.50	15.00	.3898	135
7.4	4.00	10.50	.2913	114	10.	6.50	15.00	.3937	135
7.5	4.00	10.50	.2953	116	10.5	7.25	17.00	.4134	140
7.6	4.50	10.50	.2992	116	11.	8.00	17.00	.4331	145
7.7	4.50	10.50	.3031	117	11.5	9.00	18.75	.4528	145
7.75	4.50	10.50	.3051	119	12.	10.00	20.00	.4724	151
7.8	4.50	10.50	.3071	119	12.5	11.00	20.00	.4921	155
7.9	4.50	10.50	.3110	121	13.	12.50	21.50	.5118	160
8.	4.50	10.50	.3150	121					

Specify our list number when ordering

Millimeter Sizes Twist Drills

Taper Square Shank—Fitting Ratchets



No. 1 Shank 9½ mm. by 16 mm. by 38 mm. long
Carbon Steel No. 229 **High Speed Steel No. 729**
No. 2 Shank 12¾ mm. by 19 mm. by 44½ mm. long
Carbon Steel No. 329 **High Speed Steel No. 829**
No. 1 Shank always furnished unless otherwise specified

Diameter	Price Each		Decimal Diameter	Length Overall	Diameter	Price Each		Decimal Diameter	Length Overall
	Carbon Steel	High Speed				Carbon Steel	High Speed		
5½	\$1.00	\$2.45	.2165	127	20½	\$1.75	\$4.00	.8071	178
6	1.00	2.50	.2362	127	21	1.90	4.20	.8268	178
6½	1.00	2.55	.2559	127	21½	1.95	4.50	.8465	190
7	1.05	2.55	.2756	127	22	2.05	4.50	.8661	190
7½	1.10	2.60	.2953	127	22½	2.15	4.70	.8858	190
8	1.10	2.65	.3150	127	23	2.20	4.70	.9055	190
8½	1.15	2.65	.3346	127	23½	2.25	5.00	.9252	203
9	1.20	2.70	.3543	153	24	2.30	5.25	.9449	203
9½	1.20	2.70	.3740	153	24½	2.40	5.25	.9646	203
10	1.25	2.75	.3937	159	25	2.50	5.50	.9842	216
10½	1.25	2.80	.4134	159	25½	2.60	5.75	1.0039	216
11	1.25	2.80	.4331	159	26	2.70	5.75	1.0236	216
11½	1.30	2.85	.4528	159	26½	2.75	6.00	1.0433	216
12	1.30	2.90	.4724	159	27	2.85	6.30	1.0630	216
12½	1.30	2.90	.4921	159	27½	3.00	6.30	1.0827	216
13	1.35	2.95	.5118	159	28	3.05	6.70	1.1024	229
13½	1.35	3.00	.5315	159	28½	3.10	6.70	1.1220	229
14	1.35	3.00	.5512	159	29	3.25	7.00	1.1417	229
14½	1.40	3.10	.5709	159	29½	3.30	7.30	1.1614	229
15	1.40	3.10	.5905	159	30	3.35	7.30	1.1811	229
15½	1.40	3.20	.6102	159	30½	3.40	7.60	1.2008	229
16	1.45	3.30	.6299	159	31	3.50	7.90	1.2205	229
16½	1.45	3.30	.6496	159	31½	3.65	7.90	1.2402	229
17	1.45	3.40	.6693	159	32	3.75	8.25	1.2598	229
17½	1.50	3.50	.6890	159	33	3.90	8.60	1.2992	229
18	1.50	3.50	.7087	159	34	4.05	9.00	1.3386	229
18½	1.55	3.65	.7283	159	35	4.20	9.80	1.3779	229
19	1.55	3.65	.7480	159	36	4.50	10.20	1.4173	229
19½	1.65	3.80	.7677	159	37	4.65	10.60	1.4567	229
20	1.65	4.00	.7874	171	38	4.80	11.00	1.4961	229

Specify our list number when ordering

Left Hand Twist Drills



Taper Shank

Carbon Steel No. 152

High Speed Steel No. 652

Dimensions and List Prices same as Right Hand Drills No. 102 and No. 602, pages 202, 203 and 204. *Special Discount.*



Straight Shank, Taper Length

Carbon Steel No. 154

High Speed Steel No. 654

Dimensions and List Prices same as Right Hand Drills No. 104 and No. 604, pages 206, 207 and 208. *Special Discount.*



Jobbers' Length

Carbon Steel No. 155

High Speed Steel No. 655

Dimensions and List Prices same as Right Hand Drills No. 105 and No. 605, page 209. *Special Discount.*



Wire Gauge

Carbon Steel No. 255

High Speed Steel No. 755

Dimensions and List Prices same as Right Hand Drills No. 205 and No. 705, pages 211 and 212. *Special Discount.*

Specify our list number when ordering

Straight Fluted Drills



Taper Shank

Carbon Steel No. 172

Dimensions and List Prices same as No. 102, pages 202, 203 and 204.



Straight Shank, Taper Length

Carbon Steel No. 174

Dimensions and List Prices same as No. 104, pages 206, 207 and 208.



Jobbers' Length

Carbon Steel No. 175

Dimensions and List Prices same as No. 105, page 209.



Wire Gauge

Carbon Steel No. 275

Dimensions and List Prices same as No. 205, pages 211 and 212.

These drills are especially adapted for work in brass, copper and other soft metals, as they will not run ahead or "hog in."

Specify our list number when ordering



Double Groove Shank Drills



Taper Length

Carbon Steel No. 106

High Speed Steel No. 606

Dimensions and List Prices same as Straight Shank Taper Length Drills No. 104 and No. 604, pages 206, 207 and 208.



Jobbers' Length

Carbon Steel No. 206

High Speed Steel No. 706

Dimensions and List Prices same as Jobbers' Drills No. 105 and No. 605, page 209.

Steel Sleeves

For Taper Shank Drills



No. 62

Size	Hole	Outside Fitting	Price Each
No. 1 to 2	No. 1	No. 2 Socket	\$1.80
No. 1 to 3	No. 1	No. 3 Socket	2.40
No. 1 to 4	No. 1	No. 4 Socket	3.00
No. 1 to 5	No. 1	No. 5 Socket	4.40
No. 2 to 3	No. 2	No. 3 Socket	2.40
No. 2 to 4	No. 2	No. 4 Socket	3.00
No. 2 to 5	No. 2	No. 5 Socket	4.40
No. 3 to 4	No. 3	No. 4 Socket	3.00
No. 3 to 5	No. 3	No. 5 Socket	4.40
No. 4 to 5	No. 4	No. 5 Socket	4.40
No. 4 to 6	No. 4	No. 6 Socket	10.00
No. 5 to 6	No. 5	No. 6 Socket	10.00

Specify our list number when ordering



Steel Sockets—Unfinished Shanks

For Taper Shank Drills

Shanks left rough to be fitted to machine



No. 74

Number	Holds Drills	Price Each
1	$\frac{1}{16}$ to $\frac{9}{16}$ inclusive	\$1.20
2	$\frac{37}{64}$ to $\frac{29}{32}$ inclusive	1.80
3	$\frac{59}{64}$ to $1\frac{1}{4}$ inclusive	2.50
4	$1\frac{17}{64}$ to 2" inclusive	4.00
5	$2\frac{1}{64}$ to 3" inclusive	7.50
6	$3\frac{1}{64}$ to 6" inclusive	14.00

Steel Sockets

For Taper Shank Drills



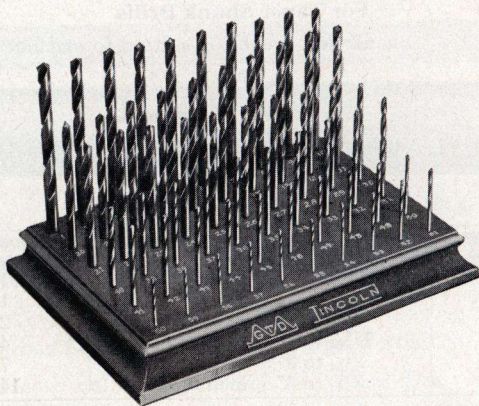
No. 72

Size	Hole	Shank	Price Each
No. 1 to 2	No. 1	No. 2	\$2.00
No. 1 to 3	No. 1	No. 3	2.50
No. 1 to 4	No. 1	No. 4	3.20
No. 1 to 5	No. 1	No. 5	4.80
No. 2 to 3	No. 2	No. 3	2.50
No. 2 to 4	No. 2	No. 4	3.20
No. 2 to 5	No. 2	No. 5	4.80
No. 3 to 2	No. 3	No. 2	3.20
No. 3 to 3	No. 3	No. 3	3.20
No. 3 to 4	No. 3	No. 4	3.20
No. 3 to 5	No. 3	No. 5	4.80
No. 4 to 3	No. 4	No. 3	4.80
No. 4 to 4	No. 4	No. 4	4.80
No. 4 to 5	No. 4	No. 5	4.80
No. 4 to 6	No. 4	No. 6	12.00
No. 5 to 4	No. 5	No. 4	12.00
No. 5 to 5	No. 5	No. 5	12.00
No. 5 to 6	No. 5	No. 6	12.00

Specify our list number when ordering



Sets of Carbon Steel Twist Drills



Set No.	Kind	Range of Sizes	No. of Drills	Price per Set
1	Taper Shank	$\frac{1}{4}$ to 1", incl., by 16ths	13	\$22.40
2	Taper Shank	$\frac{3}{8}$ to 1 $\frac{1}{4}$ ", incl., by 16ths	15	40.10
3	Taper Shank	$\frac{3}{8}$ to $\frac{3}{4}$ ", incl., by 32nds and $1\frac{1}{16}$ to 1 $\frac{1}{4}$ ", incl., by 16ths	21	48.50
5	Jobbers	$\frac{1}{16}$ to $\frac{1}{2}$ ", incl., by 64ths, mounted on maple block	29	15.00
6	Jobbers	$\frac{1}{16}$ to $\frac{1}{2}$ ", incl., by 32nds, mounted on maple block	15	9.50
7	Wire Gauge Jobbers	No. 1 to 60, inclusive, $\frac{1}{4}$ to $\frac{3}{8}$ ", incl., by 32nds, mounted on maple block	65	15.75
8	Wire Gauge	No. 1 to 60, inclusive, mounted on maple block	60	13.25
9	Wire Gauge	No. 1 to 59, incl., alternate sizes, mounted on maple block	30	8.50
15	Letter sizes	A to Z, incl., straight shank, mounted on maple block	26	13.50

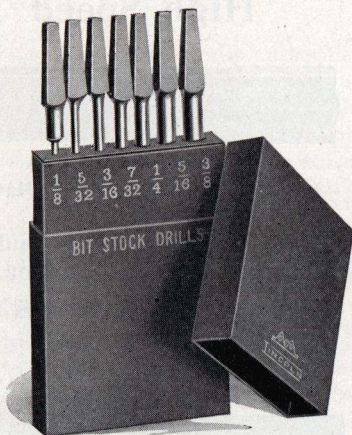
Maple Blocks for Sets 5, 6, 7, 8, 9 and 15 Without Drills, \$2.50
Specify our list number when ordering

Sets of Bit Stock Drills

No. 14 Set

Contains one each $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$ inch Bit Stock Drills. Neatly packed in a flat leatherette case, on which the sizes are plainly marked.

Price \$4.35



No. 14 Set

No. 13 Set

Contains one each $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$ and $\frac{3}{8}$ inch Bit Stock Drills.

The drills are attractively finished, each one fitting the proper hole drilled in the case. The case itself is a solid hardwood block, stained and polished, with cover to match.

Price \$4.85



No. 13 Set

No. 13A Set

Same drills as No. 13 Set, but packed in the leatherette case furnished with No. 14 Set.

Consists of one each $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$ and $\frac{3}{8}$ inch Bit Stock Drills.

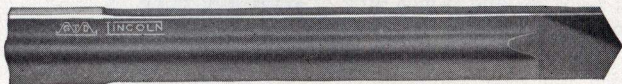
Price \$4.85

For list of Bit Stock Drills, see page 228.

Specify our list number when ordering

**LINCOLN**

High Speed Track Bits



No. 990. Flat Beaded

Fitting Flat Drill Chucks on **Paulus, New Style Paulus, Buda, Girder and Heavy Track Drilling Machines.**

Thickness of bits $\frac{1}{2}$ inch to $1\frac{1}{16}$ inch is $\frac{5}{16}$ inch. No. 1 Bead.

Thickness of bits $2\frac{3}{32}$ inch to $1\frac{1}{4}$ inch is $\frac{3}{8}$ inch. No. 2 Bead.



No. 998. Flat with Combination Flat Beaded and Round Shank

This bit will fit all Chucks for track drilling machines listed under No. 990.

Thickness of bits $\frac{1}{2}$ inch to $1\frac{1}{16}$ inch is $\frac{5}{16}$ inch. No. 1 Bead.

Thickness of bits $2\frac{3}{32}$ inch to $1\frac{1}{4}$ inch is $\frac{3}{8}$ inch. No. 2 Bead.

Shanks on these bits are $2\frac{1}{4}$ inches long, .648 diameter, commonly called $4\frac{1}{64}$ inch.

Size In.	Length Ins.	Size In.	Length Ins.
$\frac{5}{8}$	$6\frac{1}{4}$	1	$6\frac{1}{4}$
$1\frac{1}{16}$	$6\frac{1}{4}$	$1\frac{1}{16}$	$6\frac{1}{4}$
$\frac{3}{4}$	$6\frac{1}{4}$	$1\frac{1}{8}$	$6\frac{1}{4}$
$1\frac{3}{16}$	$6\frac{1}{4}$	$1\frac{3}{16}$	$6\frac{1}{4}$
$\frac{7}{8}$	$6\frac{1}{4}$	$1\frac{1}{4}$	$6\frac{1}{4}$
$1\frac{5}{16}$	$6\frac{1}{4}$		

Prices on application.

Specify our list number when ordering

Speeds and Feeds

After continuous experiments and consultation with authorities, we have found that it is impossible to establish an absolute rule governing the speeds and feeds of drills, owing to the great variation in the hardness and density in different runs of the various metals, and also to the character and form of different pieces to be drilled, that is, whether the piece is hard or soft, large or small, thick or thin, etc.

We give on page 361 a table showing the revolutions per minute, for different diameters, to secure various cutting speeds, and offer the following suggestions as a general guide.

When starting high speed drills we suggest a speed of 50 to 70 feet per minute for steel; 60 to 80 feet per minute for cast iron, and 100 to 140 feet per minute for brass. As a high speed drill gives better results after being warmed up, it is better to start at these medium speeds and then increase as the drill becomes warm until the maximum, governed by the density and toughness of the material being drilled, is reached.

The amount of feed per revolution of the drill should be about the same as that of a corresponding carbon steel drill, as the greatest efficiency can be obtained from a high speed drill when same is run at a high speed and not too heavy feed per revolution.

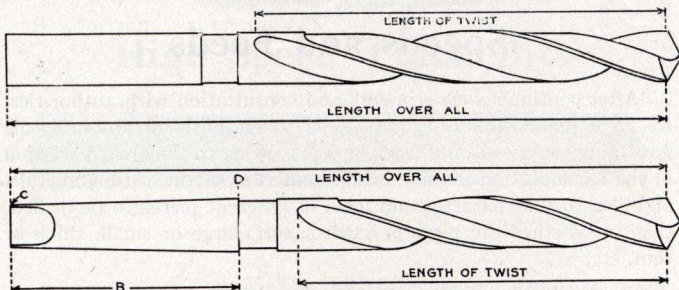
If a drill chips at the cutting edge, or the corners of the cutting edges wear away very rapidly, it is evidence that too much speed is being given, or that the drill has been ground with too much "lip" clearance.

The general rule is to run high speed drills, in steel, about double the speed of carbon drills and in cast iron about three times the speed of carbon drills.

Carbon steel drills should be run about 30 feet per minute in steel, 35 feet per minute in cast iron, and 60 to 100 feet per minute in brass, with a feed per revolution of from .004 in. to .010 in.



Special Drills



Suggestions for Ordering Special Drills

Give Catalog Number for general style of tool required.

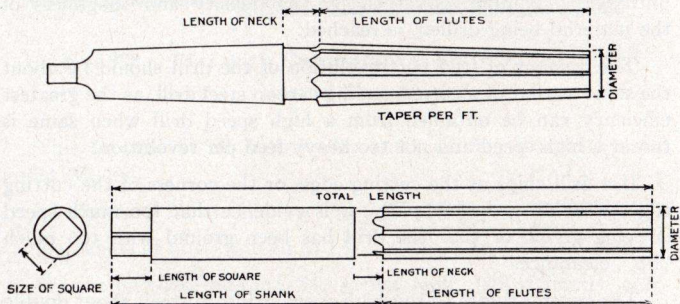
State diameter of drill in fractions, decimals or millimeters.

State length overall, length of twist and length of shank.

Give No. of taper shank, or if shank is special, give length B, and dimensions at C and D.

Where possible, give material in which drill is to be used.

Special Reamers



Suggestions for Ordering Special Reamers

Give Catalog Number for general style of tool required.

State diameter of reamer and of shank.

State whether taper, straight or square shank, and give dimensions.

State whether flute is straight or spiral, right or left hand.

Give length overall, length of flute and length of shank; for shell reamers, give also diameter of hole.

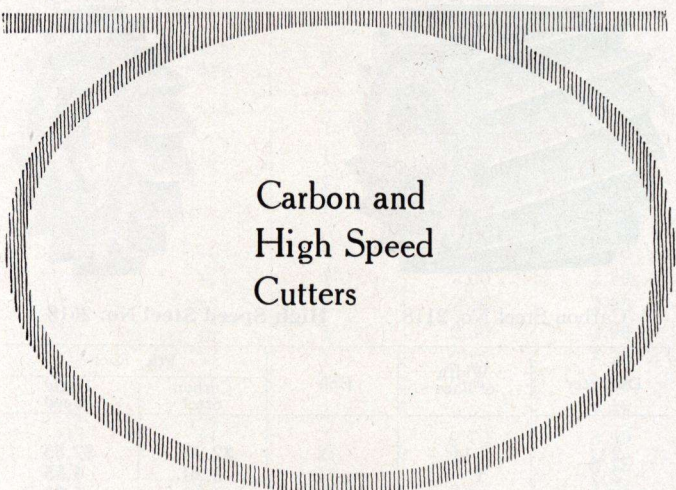
For taper reamers, give taper per foot.

Give as much information as possible to avoid error and delay.

Orders for special tools are not subject to cancellation.

Specify our list number when ordering

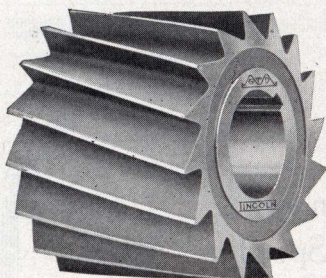
CUTTER SECTION



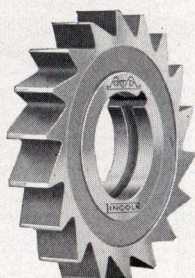
Carbon and High Speed Cutters

	Pages		Pages
Angular	272	Metal Slitting	274
Coarse Tooth	256	Plain	250-253
Coarse Tooth Plain	254, 255	Shell End Mills	268
Coarse Tooth Shell End Mills	269	Side	257-259
Coarse Tooth Side	260	Slotting, High Speed	275, 276
Coarse Tooth Spiral Cut End Mills	261	Spiral Cut End Mills	264, 265
Concave	273	St. Shank End Mills	261
Convex	273	St. Cut End Mills	262, 263
Double Angle	272	T-Slot Cutter	270
Mandrels	278	Two-Lipped Cotter Mills	267
		Woodruff Keyseat	271

Plain Milling Cutters



Carbon Steel No. 2118



High Speed Steel No. 2618

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
2 1/4	1/2	7/8	\$2.25	\$2.85
2 1/4	1	7/8	3.20	4.55
2 1/4	1 3/4	7/8	4.20	5.80
2 1/2	3/16	1	1.65	2.10
2 1/2	1/4	1	1.80	2.30
2 1/2	5/16	1	2.00	2.55
2 1/2	3/8	1	2.10	2.65
2 1/2	7/16	1	2.20	2.80
2 1/2	1/2	1	2.30	3.00
2 1/2	9/16	1	2.40	3.20
2 1/2	5/8	1	2.45	3.45
2 1/2	11/16	1	2.65	3.55
2 1/2	3/4	1	2.80	3.80
2 1/2	13/16	1	2.90	4.00
2 1/2	7/8	1	3.10	4.15
2 1/2	1	1	3.30	4.55
2 1/2	1 1/4	1	3.70	5.15
2 1/2	1 1/2	1	4.00	5.65
2 1/2	1 3/4	1	4.35	6.30

Continued on next page

Cutters of 3/4" face and larger have spiral teeth.

These cutters also listed with Coarse Undercut Teeth, see pages 254 and 255.

Cutters having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Plain Milling Cutters

Carbon Steel No. 2118

High Speed Steel No. 2618

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
2½	2	1	\$4.75	\$6.90
2½	2½	1	5.25	7.85
2½	3	1	5.70	8.80
2½	4	1	7.00	11.00
2¾	⅜	1	1.75	2.20
2¾	¼	1	2.00	2.50
2¾	⅝	1	2.10	2.70
2¾	⅜	1	2.30	2.90
2¾	⅞	1	2.35	3.20
2¾	½	1	2.40	3.30
2¾	⅞	1	2.55	3.55
2¾	⅝	1	2.70	3.90
2¾	¾	1	3.20	4.35
2¾	⅞	1	3.65	4.95
2¾	1	1	4.00	5.35
2¾	1¼	1	4.35	6.10
2¾	1½	1	4.80	6.80
2¾	2	1	5.35	7.95
2¾	2½	1	5.85	9.00
2¾	3	1	6.40	10.00
2¾	4	1¼	7.65	12.65
3	⅜	1	1.75	2.35
3	¼	1	2.10	2.75
3	⅝	1	2.35	3.20
3	⅜	1	2.70	3.55
3	⅜	1¼	2.70	3.55
3	⅞	1¼	2.85	3.85
3	½	1¼	3.10	4.10
3	⅞	1¼	3.25	4.40
3	⅝	1¼	3.45	4.70
3	¾	1¼	3.85	5.20
3	⅞	1¼	4.20	5.75
3	1	1¼	4.55	6.35

Continued on next page
Specify our list number when ordering



Plain Milling Cutters

Carbon Steel No. 2118

High Speed Steel No. 2618

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
3	1 $\frac{1}{4}$	1 $\frac{1}{4}$	\$5.10	\$7.20
3	1 $\frac{1}{2}$	1 $\frac{1}{4}$	5.45	7.85
3	1 $\frac{3}{4}$	1 $\frac{1}{4}$	5.70	8.45
3	2	1 $\frac{1}{4}$	6.00	9.00
3	2 $\frac{1}{2}$	1 $\frac{1}{4}$	6.60	10.35
3	3	1 $\frac{1}{4}$	7.00	11.20
3	3 $\frac{1}{2}$	1 $\frac{1}{4}$	7.50	12.50
3	4	1 $\frac{1}{4}$	8.15	13.80
3	5	1 $\frac{1}{4}$	9.90	16.90
3	6	1 $\frac{1}{4}$	13.70	22.15
3 $\frac{1}{2}$	3 $\frac{1}{16}$	1	1.85	2.65
3 $\frac{1}{2}$	1 $\frac{1}{4}$	1	2.20	3.10
3 $\frac{1}{2}$	5 $\frac{1}{16}$	1	2.65	3.65
3 $\frac{1}{2}$	3 $\frac{3}{8}$	1	3.10	4.25
3 $\frac{1}{2}$	7 $\frac{1}{16}$	1	3.50	4.40
3 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	4.00	5.45
3 $\frac{1}{2}$	5 $\frac{3}{8}$	1 $\frac{1}{4}$	4.40	6.05
3 $\frac{1}{2}$	3 $\frac{1}{4}$	1 $\frac{1}{4}$	4.90	6.80
3 $\frac{1}{2}$	7 $\frac{3}{8}$	1 $\frac{1}{4}$	5.55	7.70
3 $\frac{1}{2}$	1	1 $\frac{1}{4}$	6.10	8.25
3 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	7.10	10.00
3 $\frac{1}{2}$	2	1 $\frac{1}{4}$	8.15	12.30
3 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{4}$	8.75	13.80
3 $\frac{1}{2}$	3	1 $\frac{1}{4}$	9.40	15.35
3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{4}$	10.35	16.70
3 $\frac{1}{2}$	4	1 $\frac{1}{4}$	11.60	19.30
3 $\frac{1}{2}$	4	1 $\frac{1}{2}$	11.60	19.30
4	1 $\frac{1}{4}$	1	2.60	3.80
4	1 $\frac{1}{4}$	1 $\frac{1}{4}$	2.60	3.80
4	5 $\frac{1}{16}$	1	3.20	4.55
4	5 $\frac{1}{16}$	1 $\frac{1}{4}$	3.20	4.55
4	3 $\frac{3}{8}$	1	3.85	5.35

Continued on next page
Specify our list number when ordering



Plain Milling Cutters

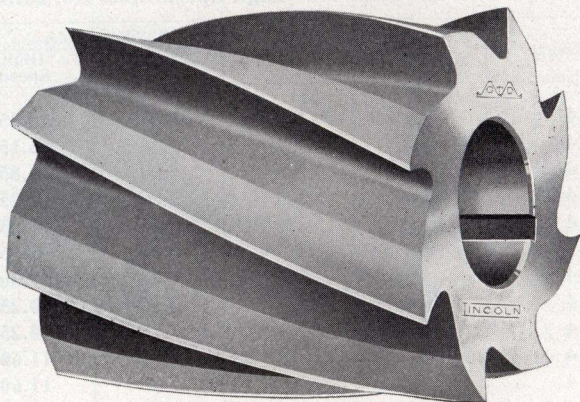
Carbon Steel No. 2118

High Speed Steel No. 2618

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
4	$\frac{3}{8}$	$1\frac{1}{4}$	\$3.85	\$5.35
4	$\frac{7}{16}$	$1\frac{1}{4}$	4.45	6.15
4	$\frac{1}{2}$	$1\frac{1}{4}$	5.00	6.85
4	$\frac{9}{16}$	$1\frac{1}{4}$	5.20	7.25
4	$\frac{5}{8}$	$1\frac{1}{4}$	5.45	7.65
4	$\frac{3}{4}$	$1\frac{1}{4}$	6.00	8.45
4	$\frac{7}{8}$	$1\frac{1}{4}$	6.55	9.30
4	1	$1\frac{1}{4}$	7.15	10.25
4	1	$1\frac{1}{2}$	7.15	10.25
4	$1\frac{1}{4}$	$1\frac{1}{4}$	7.90	11.60
4	$1\frac{1}{4}$	$1\frac{1}{2}$	7.90	11.60
4	$1\frac{1}{2}$	$1\frac{1}{4}$	8.40	12.70
4	$1\frac{1}{2}$	$1\frac{1}{2}$	8.40	12.70
4	$1\frac{3}{4}$	$1\frac{1}{4}$	9.00	13.70
4	$1\frac{3}{4}$	$1\frac{1}{2}$	9.00	13.70
4	2	$1\frac{1}{4}$	9.45	14.85
4	2	$1\frac{1}{2}$	9.45	14.85
4	3	$1\frac{1}{4}$	11.45	19.10
4	3	$1\frac{1}{2}$	11.45	19.10
4	4	$1\frac{1}{4}$	14.00	23.95
4	4	$1\frac{1}{2}$	14.00	23.95
4	5	$1\frac{1}{2}$	17.10	28.95
4	6	$1\frac{1}{2}$	19.65	34.45
$4\frac{1}{2}$	$\frac{1}{2}$	2	5.10	7.50
$4\frac{1}{2}$	$\frac{5}{8}$	2	5.60	8.60
$4\frac{1}{2}$	$\frac{3}{4}$	2	6.10	9.60
$4\frac{1}{2}$	$\frac{7}{8}$	2	6.70	10.50
$4\frac{1}{2}$	1	2	7.50	11.55
$4\frac{1}{2}$	$1\frac{1}{4}$	2	8.60	13.00
$4\frac{1}{2}$	$1\frac{1}{2}$	2	9.50	14.60
$4\frac{1}{2}$	$1\frac{3}{4}$	2	10.45	16.30
$4\frac{1}{2}$	2	2	10.80	18.00
$4\frac{1}{2}$	6	2	24.70	45.10

Specify our list number when ordering

Coarse Tooth Plain Milling Cutters



High Speed Steel No. 2818

Cutters of $\frac{3}{4}$ " face and larger have spiral teeth.

Coarse Tooth Plain Milling Cutters of Carbon Steel, or having dimensions other than listed, are special and subject to special prices.

Continued on next page

Specify our list number when ordering

Coarse Tooth Plain Milling Cutters

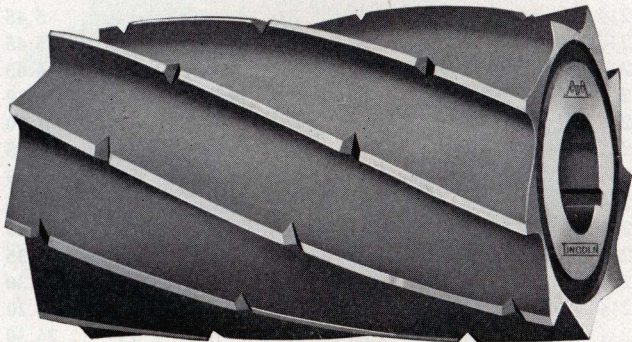
High Speed Steel No. 2818

Diam- eter	Width of Face	Hole	Price Each	Diam- eter	Width of Face	Hole	Price Each
2½	¼	1	\$2.30	3½	⅞	1¼	\$4.40
2½	⅕	1	2.55	3½	½	1¼	5.45
2½	⅜	1	2.65	3½	½	1½	5.45
2½	⅞	1	2.80	3½	⅝	1¼	6.05
2½	½	1	3.00	3½	¾	1¼	6.80
2½	⅝	1	3.45	3½	⅞	1¼	7.70
2½	¾	1	3.80	3½	1	1½	8.25
2½	⅞	1	4.15	3½	1½	1½	10.00
2½	1	1	4.55	3½	2	1½	12.30
2½	1¼	1	5.15	3½	2½	1½	13.80
2½	1½	1	5.65	3½	3	1½	15.35
2½	1¾	1	6.30	3½	4	1½	19.30
2½	2	1	6.90	3½	5	1½	22.20
2½	2½	1	7.85	3½	6	1½	26.30
2½	3	1	8.80				
2½	4	1	11.00	4	⅜	1¼	5.35
				4	⅞	1¼	6.15
3	¼	1¼	2.75	4	½	1¼	6.85
3	⅕	1¼	3.20	4	⅝	1¼	7.65
3	⅜	1¼	3.55	4	¾	1½	8.45
3	⅞	1¼	3.85	4	⅞	1¼	9.30
3	½	1¼	4.10	4	1	1½	10.25
3	⅝	1¼	4.70	4	1¼	1½	11.60
3	¾	1¼	5.20	4	1½	1½	12.70
3	⅞	1¼	5.75	4	2	1½	14.85
3	1	1¼	6.35	4	3	1½	19.10
3	1¼	1¼	7.20	4	4	1½	23.95
3	1½	1¼	7.85	4	5	1½	28.95
3	2	1¼	9.00	4	6	1½	34.45
3	2½	1¼	10.35				
3	3	1¼	11.20	4½	1	2	11.55
3	4	1¼	13.80	4½	1¼	2	13.00
3	5	1¼	16.90	4½	1½	2	14.60
3	6	1¼	22.15	4½	2	2	18.00
				4½	3	2	24.30
3½	¼	1¼	3.10	4½	4	2	30.75
3½	⅕	1¼	3.65	4½	5	2	37.85
3½	⅜	1¼	4.25	4½	6	2	45.10

Specify our list number when ordering

Coarse Tooth Milling Cutters

With Nicked Teeth



High Speed Steel No. 2748

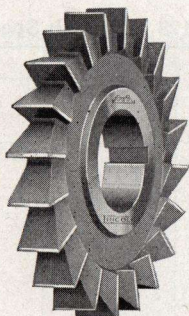
Diameter	Width of Face	Hole	Price Each
2½	3	1	\$10.00
3	4	1¼	15.55
3½	4	1½	21.75
3½	6	1½	29.60
4½	4	2	34.30
4½	6	2	50.15

The nicks or chip breakers in the teeth of these cutters are form-relieved.

All sizes and dimensions not listed are special and subject to special prices.

Specify our list number when ordering

Side Milling Cutters



Carbon Steel No. 2128

High Speed Steel No. 2628

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
2	$\frac{3}{16}$	$\frac{1}{2}$	\$2.35	\$2.80
2	$\frac{3}{16}$	$\frac{5}{8}$	2.35	2.80
2	$\frac{1}{4}$	$\frac{1}{2}$	2.60	3.00
2	$\frac{1}{4}$	$\frac{5}{8}$	2.60	3.00
2	$\frac{3}{8}$	$\frac{1}{2}$	2.80	3.25
2	$\frac{3}{8}$	$\frac{5}{8}$	2.80	3.25
$2\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{8}$	2.80	3.30
$2\frac{1}{2}$	$\frac{5}{16}$	$\frac{7}{8}$	2.90	3.60
$2\frac{1}{2}$	$\frac{3}{8}$	$\frac{7}{8}$	3.15	3.70
$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{7}{8}$	3.25	3.85
$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{8}$	3.40	4.10

Continued on next page

These cutters are often used in pairs for sizing nuts, bolt heads, etc., and are then called "Straddle Mills." They have teeth upon both sides and edges.

For Coarse Undercut Tooth Side Milling Cutters, see page 260.

Cutters having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Side Milling Cutters

' Carbon Steel No. 2128

High Speed Steel No. 2628

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
$2\frac{3}{4}$	$\frac{1}{4}$	$\frac{7}{8}$	\$2.90	\$3.55
$2\frac{3}{4}$	$\frac{5}{16}$	$\frac{7}{8}$	3.20	3.80
$2\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	3.40	4.00
$2\frac{3}{4}$	$\frac{7}{16}$	$\frac{7}{8}$	3.50	4.35
$2\frac{3}{4}$	$\frac{7}{16}$	1	3.50	4.35
$2\frac{3}{4}$	$\frac{1}{2}$	$\frac{7}{8}$	3.60	4.45
$2\frac{3}{4}$	$\frac{1}{2}$	1	3.60	4.45
3	$\frac{1}{4}$	1	3.15	3.85
3	$\frac{5}{16}$	1	3.50	4.35
3	$\frac{3}{8}$	1	3.85	4.75
3	$\frac{7}{16}$	1	4.10	5.10
3	$\frac{1}{2}$	1	4.30	5.40
3	$\frac{1}{2}$	$1\frac{1}{4}$	4.30	5.40
$3\frac{1}{2}$	$\frac{7}{16}$	1	4.80	5.75
$3\frac{1}{2}$	$\frac{1}{2}$	1	5.35	6.95
$3\frac{1}{2}$	$\frac{9}{16}$	1	5.55	7.65
$3\frac{1}{2}$	$\frac{5}{8}$	1	5.80	7.65
4	$\frac{1}{4}$	1	3.70	5.05
4	$\frac{3}{8}$	1	5.15	6.85
4	$\frac{3}{8}$	$1\frac{1}{4}$	5.15	6.85
4	$\frac{1}{2}$	1	6.50	8.55
4	$\frac{1}{2}$	$1\frac{1}{4}$	6.50	8.55
4	$\frac{5}{8}$	1	7.10	9.45
4	$\frac{5}{8}$	$1\frac{1}{4}$	7.10	9.45
4	$\frac{3}{4}$	1	7.65	10.40

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Specify our list number when ordering

Side Milling Cutters

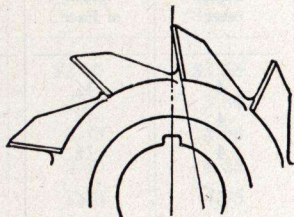
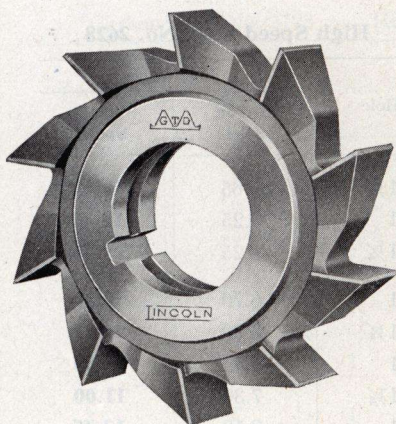
Carbon Steel No. 2128

High Speed Steel No. 2628

Diameter	Width of Face	Hole	Price Each	
			Carbon Steel	High Speed
4	$\frac{3}{4}$	$1\frac{1}{4}$	\$7.65	\$10.40
4	$\frac{7}{8}$	1	8.25	11.35
4	$\frac{7}{8}$	$1\frac{1}{4}$	8.25	11.35
5	$\frac{1}{2}$	1	6.70	9.80
5	$\frac{1}{2}$	$1\frac{1}{4}$	6.70	9.80
5	$\frac{5}{8}$	1	7.30	11.00
5	$\frac{5}{8}$	$1\frac{1}{4}$	7.30	11.00
5	$\frac{3}{4}$	1	8.10	12.45
5	$\frac{3}{4}$	$1\frac{1}{4}$	8.10	12.45
5	$\frac{7}{8}$	1	8.75	13.65
5	$\frac{7}{8}$	$1\frac{1}{4}$	8.75	13.65
5	1	1	9.90	15.05
5	1	$1\frac{1}{4}$	9.90	15.05
6	$\frac{1}{2}$	1	8.55	12.25
6	$\frac{1}{2}$	$1\frac{1}{4}$	8.55	12.25
6	$\frac{5}{8}$	$1\frac{1}{4}$	9.10	13.80
6	$\frac{3}{4}$	1	9.65	15.35
6	$\frac{3}{4}$	$1\frac{1}{4}$	9.65	15.35
6	$\frac{7}{8}$	$1\frac{1}{4}$	10.25	16.90
6	1	1	11.00	18.55
6	1	$1\frac{1}{4}$	11.00	18.55
6	1	$1\frac{1}{2}$	11.00	18.55
7	$\frac{3}{4}$	$1\frac{1}{4}$	17.50	23.85
7	1	$1\frac{1}{4}$	20.40	28.95
8	1	$1\frac{1}{4}$	24.75	37.30

Specify our list number when ordering

Coarse Tooth Side Milling Cutters



High Speed Steel No. 2828

Diam-eter	Width of Face	Hole	Price Each	Diam-eter	Width of Face	Hole	Price Each
2 1/2	1/4	1	\$3.30	4	5/8	1 1/4	\$9.45
2 1/2	5/16	1	3.60	4	5/8	1 1/2	9.45
2 1/2	3/8	1	3.70	4	3/4	1 1/4	10.40
				4	3/4	1 1/2	10.40
3	1/4	1 1/4	3.85	4	7/8	1 1/4	11.35
3	5/16	1 1/4	4.35	4	7/8	1 1/2	11.35
3	3/8	1 1/4	4.75				
3	7/16	1 1/4	5.10	5	3/4	1 1/4	12.45
3	1/2	1 1/4	5.40	5	3/4	1 1/2	12.45
				5	7/8	1 1/4	13.65
				5	7/8	1 1/2	13.65
3 1/2	7/16	1 1/4	5.75	5	1	1 1/2	15.05
3 1/2	1/2	1 1/4	6.95				
3 1/2	5/8	1 1/4	7.65				
				6	3/4	1 1/2	15.35
4	1/2	1 1/4	8.55	6	1	1 1/2	18.55
4	1/2	1 1/2	8.55				
				8	1	1 1/2	37.30

Coarse Tooth Side Milling Cutters of Carbon Steel, or having dimensions other than listed, are special and subject to special prices.

Specify our list number when ordering

Straight Shank End Mills



Carbon Steel No. 2134

High Speed Steel No. 2634

Diameter	Price Each		Length Overall	Length of Cut
	Carbon Steel	High Speed		
$\frac{1}{8}$	\$0.45	\$0.50	$1\frac{1}{4}$	$\frac{5}{16}$
$\frac{5}{32}$	.50	.60	$1\frac{1}{4}$	$\frac{5}{16}$
$\frac{3}{16}$	.55	.70	$1\frac{1}{2}$	$\frac{9}{16}$
$\frac{7}{32}$	.65	.80	$1\frac{1}{2}$	$\frac{9}{16}$
$\frac{1}{4}$	.70	.90	$1\frac{7}{8}$	$\frac{3}{4}$
$\frac{9}{32}$	.75	1.00	$1\frac{7}{8}$	$\frac{3}{4}$
$\frac{5}{16}$	.90	1.10	$1\frac{15}{16}$	$1\frac{3}{16}$
$\frac{3}{8}$	1.00	1.30	2	$1\frac{3}{16}$
$\frac{7}{16}$	1.25	1.50	$2\frac{1}{8}$	$\frac{7}{8}$
$\frac{1}{2}$	1.60	1.70	$2\frac{1}{4}$	$1\frac{5}{16}$
$\frac{9}{16}$	1.70	1.90	$2\frac{5}{16}$	$1\frac{5}{16}$
$\frac{5}{8}$	1.90	2.10	$2\frac{3}{8}$	1
$\frac{3}{4}$	2.15	2.50	$2\frac{15}{16}$	$1\frac{1}{8}$

When ordering, state whether right or left hand mills are wanted.

All mills less than $\frac{3}{8}$ " diameter have straight teeth; $\frac{3}{8}$ " and larger have spiral.

Straight Shank End Mills having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering

Straight Cut End Mills

With Morse Taper Shanks



Carbon Steel No. 2131

High Speed Steel No. 2631

Diameter	Taper Shank	Price Each		Length Overall	Length of Cut
		Carbon Steel	High Speed		
$\frac{1}{4}$	1	\$1.45	\$1.70	$3\frac{5}{8}$	$1\frac{3}{16}$
$\frac{5}{16}$	1	1.45	1.70	$3\frac{11}{16}$	$\frac{7}{8}$
$\frac{3}{8}$	1	1.55	1.75	$3\frac{11}{16}$	$\frac{7}{8}$
$\frac{7}{16}$	1	1.60	1.85	$3\frac{3}{4}$	$1\frac{5}{16}$
$\frac{7}{16}$	2	1.75	2.25	$4\frac{1}{2}$	1
$\frac{1}{2}$	1	1.65	1.90	$3\frac{13}{16}$	1
$\frac{1}{2}$	2	1.80	2.30	$4\frac{5}{8}$	$1\frac{1}{8}$
$\frac{9}{16}$	1	1.70	2.00	$3\frac{7}{8}$	$1\frac{1}{16}$
$\frac{1}{16}$	2	2.00	2.40	$4\frac{3}{4}$	$1\frac{1}{4}$
$\frac{5}{8}$	2	2.00	2.50	5	$1\frac{1}{2}$
$1\frac{1}{16}$	2	2.20	2.75	5	$1\frac{1}{2}$
$\frac{3}{4}$	2	2.25	2.85	$5\frac{1}{8}$	$1\frac{5}{8}$
$\frac{3}{4}$	3	2.50	3.45	$5\frac{15}{16}$	$1\frac{5}{8}$
$\frac{7}{8}$	2	2.65	3.40	$5\frac{1}{4}$	$1\frac{3}{4}$
$\frac{7}{8}$	3	2.85	3.75	$6\frac{1}{16}$	$1\frac{3}{4}$
1	2	2.70	3.60	$5\frac{3}{8}$	$1\frac{7}{8}$
1	3	2.90	4.00	$6\frac{3}{16}$	$1\frac{7}{8}$
$1\frac{1}{8}$	3	3.00	4.25	$6\frac{5}{16}$	2
$1\frac{1}{4}$	3	3.10	4.65	$6\frac{5}{16}$	2

These End Mills are regularly furnished right hand. End mills having dimensions other than listed, and left hand end mills are special and subject to special prices.

For Spiral Cut End Mills, see pages 264 and 265.

For Coarse Tooth Spiral Cut End Mills, see page 266.

Specify our list number when ordering

Straight Cut End Mills

With Brown & Sharpe Taper Shanks



Carbon Steel No. 2231

High Speed Steel No. 2731

Diameter	Taper Shank	Price Each		Length Overall	Length of Cut
		Carbon Steel	High Speed		
1/4	4	\$1.25	\$1.40	2 7/16	1 3/16
1/4	5	1.45	1.70	3	1 3/16
5/16	4	1.25	1.40	2 1/2	7/8
5/16	5	1.45	1.70	3 1/16	7/8
3/8	4	1.40	1.55	2 1/2	7/8
3/8	5	1.55	1.75	3 1/16	7/8
7/16	4	1.40	1.55	2 9/16	1 5/16
7/16	5	1.60	1.80	3 1/8	1 5/16
1/2	5	1.65	1.90	3 3/16	1
1/2	7	1.80	2.40	5 1/8	1 1/8
9/16	5	1.70	2.00	3 1/4	1 1/16
9/16	7	2.00	2.50	5 1/4	1 1/4
5/8	5	1.80	2.20	3 7/16	1 1/4
5/8	7	2.15	2.80	5 1/2	1 1/2
11/16	7	2.20	2.85	5 1/2	1 1/2
3/4	7	2.25	2.95	5 5/8	1 5/8
3/4	9	2.50	3.85	6 7/8	1 5/8
7/8	7	2.65	3.55	5 3/4	1 3/4
7/8	9	2.85	4.25	7	1 3/4
1	7	2.70	3.80	5 7/8	1 7/8
1	9	2.90	4.35	7 1/8	1 7/8
1 1/8	7	2.85	4.20	6	2
1 1/8	9	3.00	4.60	7 1/4	2
1 1/4	7	2.85	4.45	6	2
1 1/4	9	3.25	5.10	7 1/4	2
1 3/8	9	3.45	6.25	7 3/8	2 1/8
1 1/2	9	3.80	6.85	7 1/2	2 1/4

When ordering, state whether right or left hand mills are wanted, and give number of shank.

For Spiral Cut End Mills, see pages 264 and 265.

For Coarse Tooth Spiral Cut End Mills, see page 266.

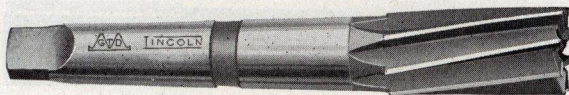
End mills having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Spiral Cut End Mills

With Morse Taper Shanks



Carbon Steel No. 2132

High Speed Steel No. 2632

Diameter	Taper Shank	Price Each		Length Overall	Length of Cut
		Carbon Steel	High Speed		
$\frac{1}{4}$	1	\$1.45	\$1.70	$3\frac{5}{8}$	$1\frac{3}{16}$
$\frac{5}{16}$	1	1.45	1.70	$3\frac{11}{16}$	$\frac{7}{8}$
$\frac{3}{8}$	1	1.55	1.75	$3\frac{11}{16}$	$\frac{7}{8}$
$\frac{7}{16}$	1	1.60	1.85	$3\frac{3}{4}$	$1\frac{5}{16}$
$\frac{7}{16}$	2	1.75	2.25	$4\frac{1}{2}$	1
$\frac{1}{2}$	1	1.65	1.90	$3\frac{13}{16}$	1
$\frac{1}{2}$	2	1.80	2.30	$4\frac{5}{8}$	$1\frac{1}{8}$
$\frac{9}{16}$	1	1.70	2.00	$3\frac{7}{8}$	$1\frac{5}{16}$
$\frac{9}{16}$	2	2.00	2.40	$4\frac{3}{4}$	$1\frac{1}{4}$
$\frac{5}{8}$	2	2.00	2.50	5	$1\frac{1}{2}$
$1\frac{1}{16}$	2	2.20	2.75	5	$1\frac{1}{2}$
$\frac{3}{4}$	2	2.25	2.85	$5\frac{1}{8}$	$1\frac{5}{8}$
$\frac{3}{4}$	3	2.50	3.45	$5\frac{15}{16}$	$1\frac{5}{8}$
$\frac{7}{8}$	2	2.65	3.40	$5\frac{1}{4}$	$1\frac{3}{4}$
$\frac{7}{8}$	3	2.85	3.75	$6\frac{1}{16}$	$1\frac{3}{4}$
1	2	2.70	3.60	$5\frac{3}{8}$	$1\frac{7}{8}$
1	3	2.90	4.00	$6\frac{3}{16}$	$1\frac{7}{8}$
1	3	2.90	4.00	$6\frac{3}{16}$	$1\frac{7}{8}$
$1\frac{1}{8}$	3	3.00	4.25	$6\frac{5}{16}$	2
$1\frac{1}{4}$	3	3.10	4.65	$6\frac{5}{16}$	2
$1\frac{1}{4}$	4	3.25	5.00	$7\frac{3}{8}$	2
$1\frac{3}{8}$	3	3.35	5.20	$6\frac{7}{16}$	$2\frac{1}{8}$
$1\frac{3}{8}$	4	3.45	5.60	$7\frac{1}{2}$	$2\frac{1}{8}$
$1\frac{1}{2}$	3	3.45	5.65	$6\frac{9}{16}$	$2\frac{1}{4}$
$1\frac{1}{2}$	4	3.80	6.25	$7\frac{5}{8}$	$2\frac{1}{4}$

These End Mills are regularly furnished right hand. End mills having dimensions other than listed, and left hand end mills are special and subject to special prices.

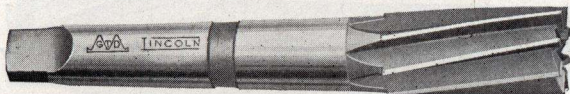
For Coarse Tooth Spiral Cut End Mills, see page 266.

For Straight Cut End Mills, see pages 262 and 263.

Specify our list number when ordering

Spiral Cut End Mills

With Brown & Sharpe Taper Shanks



Carbon Steel No. 2232

High Speed Steel No. 2732

Diameter	Taper Shank	Price Each		Length Overall	Length of Cut
		Carbon Steel	High Speed		
1/4	4	\$1.25	\$1.40	2 7/16	1 3/16
1/4	5	1.45	1.70	3	1 3/16
5/16	4	1.25	1.40	2 1/2	7/8
5/16	5	1.45	1.70	3 1/16	7/8
3/8	4	1.40	1.55	2 1/2	7/8
3/8	5	1.55	1.75	3 1/16	7/8
7/16	4	1.40	1.55	2 9/16	1 5/16
7/16	5	1.60	1.80	3 7/8	1 5/16
1/2	5	1.65	1.90	3 3/16	1
1/2	7	1.80	2.40	5 7/8	1 1/8
9/16	5	1.70	2.00	3 1/4	1 1/16
9/16	7	2.00	2.50	5 1/4	1 1/4
5/8	5	1.80	2.20	3 7/16	1 1/4
5/8	7	2.15	2.80	5 1/2	1 1/2
11/16	7	2.20	2.85	5 1/2	1 1/2
11/16	9	2.40	3.75	6 3/4	1 1/2
3/4	7	2.25	2.95	5 5/8	1 5/8
3/4	9	2.50	3.85	6 7/8	1 5/8
7/8	7	2.65	3.55	5 3/4	1 3/4
7/8	9	2.85	4.25	7	1 3/4
1	7	2.70	3.80	5 7/8	1 7/8
1	9	2.90	4.35	7 7/8	1 7/8
1 1/8	7	2.85	4.20	6	2
1 1/8	9	3.00	4.60	7 1/4	2
1 1/4	7	2.85	4.45	6	2
1 1/4	9	3.25	5.10	7 1/4	2
1 3/8	9	3.45	6.25	7 3/8	2 1/8
1 1/2	9	3.80	6.85	7 1/2	2 1/4
1 5/8	9	4.15	7.45	7 5/8	2 3/8
1 3/4	9	4.45	8.30	7 3/4	2 1/2

When ordering, state whether right or left hand mills are wanted, and give number of shank.

For Straight Cut End Mills, see pages 262 and 263.

For Coarse Tooth Spiral Cut End Mills, see page 266.

End mills having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Coarse Tooth Spiral Cut End Mills

With Brown & Sharpe Taper Shanks



High Speed Steel No. 2932

Diameter	Taper Shank	Price Each	Length Overall	Length of Cut
$\frac{1}{4}$	4	\$1.40	$2\frac{7}{16}$	$1\frac{3}{16}$
$\frac{1}{4}$	5	1.70	3	$1\frac{3}{16}$
$\frac{5}{16}$	4	1.40	$2\frac{1}{2}$	$\frac{7}{8}$
$\frac{5}{16}$	5	1.70	$3\frac{1}{16}$	$\frac{7}{8}$
$\frac{3}{8}$	4	1.55	$2\frac{1}{2}$	$\frac{7}{8}$
$\frac{3}{8}$	5	1.75	$3\frac{1}{16}$	$\frac{7}{8}$
$\frac{7}{16}$	4	1.55	$2\frac{9}{16}$	$1\frac{5}{16}$
$\frac{7}{16}$	5	1.80	$3\frac{1}{8}$	$1\frac{5}{16}$
$\frac{1}{2}$	5	1.90	$3\frac{3}{16}$	1
$\frac{1}{2}$	7	2.40	$5\frac{1}{8}$	$1\frac{1}{8}$
$\frac{9}{16}$	7	2.50	$5\frac{1}{4}$	$1\frac{1}{4}$
$\frac{5}{8}$	5	2.20	$3\frac{7}{16}$	$1\frac{1}{4}$
$\frac{5}{8}$	7	2.80	$5\frac{1}{2}$	$1\frac{1}{2}$
$1\frac{1}{16}$	7	2.85	$5\frac{1}{2}$	$1\frac{1}{2}$
$\frac{3}{4}$	7	1.95	$5\frac{5}{8}$	$1\frac{5}{8}$
$\frac{3}{4}$	9	3.85	$6\frac{7}{8}$	$1\frac{5}{8}$
$\frac{7}{8}$	7	3.55	$5\frac{3}{4}$	$1\frac{3}{4}$
$\frac{7}{8}$	9	4.25	7	$1\frac{3}{4}$
1	7	3.80	$5\frac{7}{8}$	$1\frac{7}{8}$
1	9	4.35	$7\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{1}{8}$	7	4.20	6	2
$1\frac{1}{8}$	9	4.60	$7\frac{1}{4}$	2
$1\frac{3}{16}$	9	4.90	$7\frac{1}{4}$	2
$1\frac{1}{4}$	7	4.45	6	2
$1\frac{1}{4}$	9	5.10	$7\frac{1}{4}$	2
$1\frac{1}{4}$	10	5.80	$9\frac{1}{2}$	$2\frac{1}{4}$
$1\frac{3}{8}$	9	6.25	$7\frac{3}{8}$	$2\frac{7}{8}$
$1\frac{3}{8}$	10	6.75	$9\frac{1}{2}$	$2\frac{1}{4}$
$1\frac{1}{2}$	9	6.85	$7\frac{1}{2}$	$2\frac{1}{4}$
$1\frac{1}{2}$	10	7.80	$9\frac{3}{4}$	$2\frac{1}{2}$
$1\frac{5}{8}$	9	7.45	$7\frac{5}{8}$	$2\frac{3}{8}$
$1\frac{5}{8}$	10	8.50	$9\frac{3}{4}$	$2\frac{1}{2}$
$1\frac{3}{4}$	9	8.30	$7\frac{3}{4}$	$2\frac{1}{2}$
$1\frac{3}{4}$	10	9.25	10	$2\frac{3}{4}$
2	10	10.50	10	$2\frac{3}{4}$

When ordering, state whether right or left hand mills are wanted, and give number of shank.

Coarse Tooth End Mills of Carbon Steel, or End Mills having dimensions other than listed, are special and subject to special prices.

Specify our list number when ordering

Two-Lipped Cotter Mills

With Brown & Sharpe Taper Shanks



Carbon Steel No. 2031

High Speed Steel No. 2531

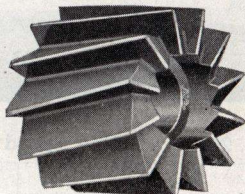
Diameter	Taper Shank	Price Each		Length Overall	Length of Cut
		Carbon Steel	High Speed		
$\frac{1}{4}$	4	\$1.25	\$1.40	2	$\frac{3}{8}$
$\frac{1}{4}$	5	1.45	1.70	$2\frac{1}{2}$	$\frac{3}{8}$
$\frac{1}{4}$	7	1.70	2.00	$4\frac{3}{8}$	$\frac{3}{8}$
$\frac{5}{16}$	5	1.45	1.70	$2\frac{19}{32}$	$\frac{15}{32}$
$\frac{5}{16}$	7	1.75	2.10	$4\frac{15}{32}$	$\frac{15}{32}$
$\frac{3}{8}$	7	1.80	2.15	$4\frac{9}{16}$	$\frac{9}{16}$
$\frac{7}{16}$	7	1.80	2.25	$4\frac{21}{32}$	$2\frac{1}{32}$
$\frac{1}{2}$	7	1.80	2.40	$4\frac{3}{4}$	$\frac{3}{4}$
$\frac{9}{16}$	7	2.00	2.50	$4\frac{27}{32}$	$2\frac{7}{32}$
$\frac{5}{8}$	7	2.15	2.80	$4\frac{15}{16}$	$\frac{15}{16}$
$\frac{11}{16}$	7	2.20	2.85	$5\frac{1}{32}$	$1\frac{1}{32}$
$\frac{3}{4}$	7	2.25	2.95	$5\frac{1}{8}$	$1\frac{1}{8}$
$\frac{13}{16}$	7	2.40	3.35	$5\frac{7}{32}$	$1\frac{7}{32}$
$\frac{7}{8}$	7	2.65	3.55	$5\frac{15}{16}$	$1\frac{7}{32}$
$\frac{7}{8}$	9	2.85	4.25	$6\frac{9}{16}$	$\frac{15}{16}$
$\frac{15}{16}$	9	2.65	4.25	$6\frac{21}{32}$	$1\frac{13}{32}$
1	9	2.90	4.35	$6\frac{3}{4}$	$1\frac{1}{2}$
$1\frac{1}{8}$	9	3.00	4.60	$6\frac{15}{16}$	$1\frac{11}{16}$
$1\frac{1}{4}$	9	3.25	5.10	$7\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{3}{8}$	9	3.45	6.25	$7\frac{5}{16}$	$2\frac{1}{16}$
$1\frac{1}{2}$	9	3.80	6.85	$7\frac{1}{2}$	$2\frac{1}{4}$

When ordering, state whether right or left hand mills are wanted, and give number of shank.

Two-Lipped Cotter Mills having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering

Shell End Mills



Carbon Steel No. 2136

High Speed Steel No. 2636

Diameter	Price Each		Length of Cut	Hole
	Carbon Steel	High Speed		
1 1/4	\$3.90	\$4.50	1 1/4	1/2
1 5/16	4.00	4.55	1 1/4	1/2
1 3/8	4.00	4.60	1 1/4	1/2
1 7/16	4.10	4.70	1 1/4	1/2
1 1/2	4.10	4.80	1 1/4	1/2
1 9/16	5.00	6.00	1 3/4	3/4
1 5/8	5.00	6.15	1 3/4	3/4
1 11/16	5.15	6.30	1 3/4	3/4
1 3/4	5.15	6.45	1 3/4	3/4
1 13/16	5.30	6.60	1 3/4	3/4
1 7/8	5.30	6.70	1 3/4	3/4
1 15/16	5.45	6.85	1 3/4	3/4
2	5.45	7.05	1 3/4	3/4
2 1/8	5.60	7.25	1 3/4	3/4
2 1/4	6.20	8.55	2 1/4	1
2 3/8	6.35	8.85	2 1/4	1
2 1/2	6.50	9.15	2 1/4	1
2 5/8	6.80	9.75	2 1/4	1
2 3/4	7.15	10.40	2 1/4	1
2 7/8	7.55	11.00	2 1/4	1
3	8.00	11.75	2 1/4	1

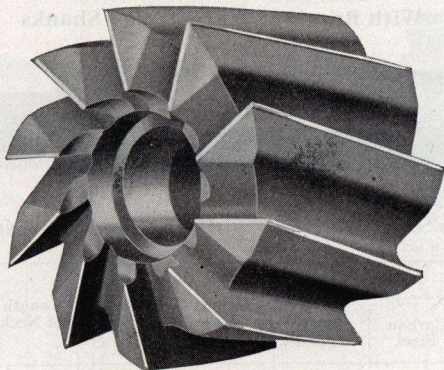
When ordering, state whether right or left hand mills are wanted.

For Coarse Undercut Tooth Shell End Mills, see page 269.

Shell End Mills with Straight Teeth, or those having dimensions other than listed, are special and subject to special prices.

Specify our list number when ordering

Coarse Tooth Shell End Mills



High Speed Steel No. 2836

Diameter	Price Each	Length of Cut	Hole
1 $\frac{1}{4}$	\$4.50	1 $\frac{1}{4}$	$\frac{1}{2}$
1 $\frac{5}{16}$	4.55	1 $\frac{1}{4}$	$\frac{1}{2}$
1 $\frac{3}{8}$	4.60	1 $\frac{1}{4}$	$\frac{1}{2}$
1 $\frac{7}{16}$	4.70	1 $\frac{1}{4}$	$\frac{1}{2}$
1 $\frac{1}{2}$	4.80	1 $\frac{1}{4}$	$\frac{1}{2}$
1 $\frac{9}{16}$	6.00	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{5}{8}$	6.15	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{11}{16}$	6.30	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{3}{4}$	6.45	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{13}{16}$	6.60	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{7}{8}$	6.70	1 $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{15}{16}$	6.85	1 $\frac{3}{4}$	$\frac{3}{4}$
2	7.05	1 $\frac{3}{4}$	$\frac{3}{4}$
2 $\frac{1}{8}$	7.25	1 $\frac{3}{4}$	$\frac{3}{4}$
2 $\frac{1}{4}$	8.55	2 $\frac{1}{4}$	1
2 $\frac{3}{8}$	8.85	2 $\frac{1}{4}$	1
2 $\frac{1}{2}$	9.15	2 $\frac{1}{4}$	1
2 $\frac{5}{8}$	9.75	2 $\frac{1}{4}$	1
2 $\frac{3}{4}$	10.40	2 $\frac{1}{4}$	1
2 $\frac{7}{8}$	11.00	2 $\frac{1}{4}$	1
3	11.75	2 $\frac{1}{4}$	1

When ordering, state whether right or left hand mills are wanted.

Coarse Tooth Shell End Mills with straight teeth, or of carbon steel, or having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Standard T Slot Cutters

With Brown & Sharpe Taper Shanks



Carbon Steel No. 2281

High Speed Steel No. 2781

Diameter of Cutter	Price Each		Thickness of Cutter	Diameter of Neck	Length of Neck	Taper Shank
	Carbon Steel	High Speed				
$\frac{1}{2}$	\$2.00	\$2.10	$\frac{5}{32}$	$\frac{7}{32}$	$\frac{13}{32}$	4
$\frac{1}{2}$	2.10	2.25	$\frac{5}{32}$	$\frac{7}{32}$	$\frac{15}{32}$	5
$\frac{5}{8}$	2.20	2.60	$\frac{5}{32}$	$\frac{9}{32}$	$\frac{17}{32}$	5
$\frac{5}{8}$	2.65	3.25	$\frac{5}{32}$	$\frac{9}{32}$	$\frac{19}{32}$	7
$\frac{11}{16}$	2.55	2.90	$\frac{7}{32}$	$\frac{11}{32}$	$\frac{19}{32}$	5
$\frac{11}{16}$	2.80	3.35	$\frac{7}{32}$	$\frac{11}{32}$	$\frac{21}{32}$	7
$\frac{13}{16}$	3.00	3.65	$\frac{7}{32}$	$\frac{3}{8}$	$\frac{21}{32}$	7
$\frac{15}{16}$	3.30	4.15	$\frac{9}{32}$	$\frac{7}{16}$	$\frac{25}{32}$	7
$\frac{15}{16}$	3.50	4.80	$\frac{9}{32}$	$\frac{7}{16}$	$\frac{27}{32}$	9
$\frac{13}{16}$	3.90	5.55	$\frac{13}{32}$	$\frac{17}{32}$	$\frac{11}{32}$	9
$\frac{15}{16}$	4.35	6.35	$\frac{17}{32}$	$\frac{21}{32}$	$\frac{19}{32}$	9
$\frac{15}{8}$	4.75	7.75	$\frac{11}{16}$	$\frac{25}{32}$	$\frac{19}{32}$	9

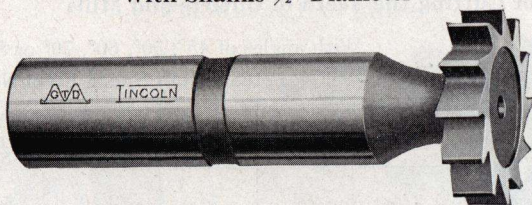
The above Cutters have diameters $\frac{1}{32}$ " larger and are $\frac{1}{64}$ " thicker than sizes given above to allow for sharpening. When ordering, state whether right or left hand cutters are wanted.

T Slot Cutters having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering

Woodruff Keyseat Cutters

With Shanks $\frac{1}{2}$ " Diameter



Carbon Steel No. 2187

High Speed Steel No. 2687

Number	Diameter	Thickness	Price Each	
			Carbon Steel	High Speed
1	$\frac{1}{2}$	$\frac{1}{16}$	\$1.20	....
2	$\frac{1}{2}$	$\frac{3}{32}$	1.20	....
3	$\frac{1}{2}$	$\frac{1}{8}$	1.20	\$1.20
4	$\frac{5}{8}$	$\frac{3}{32}$	1.40	1.40
5	$\frac{5}{8}$	$\frac{1}{8}$	1.40	1.40
6	$\frac{5}{8}$	$\frac{5}{32}$	1.40	1.40
7	$\frac{3}{4}$	$\frac{1}{8}$	1.55	1.60
8	$\frac{3}{4}$	$\frac{5}{32}$	1.55	1.60
9	$\frac{3}{4}$	$\frac{3}{16}$	1.55	1.60
10	$\frac{7}{8}$	$\frac{5}{32}$	1.75	1.95
11	$\frac{7}{8}$	$\frac{3}{16}$	1.75	1.95
12	$\frac{7}{8}$	$\frac{7}{32}$	1.75	1.95
A	$\frac{7}{8}$	$\frac{1}{4}$	1.75	1.95
13	1	$\frac{3}{16}$	2.00	2.35
14	1	$\frac{7}{32}$	2.00	2.35
15	1	$\frac{1}{4}$	2.00	2.35
B	1	$\frac{5}{16}$	2.00	2.35
16	$1\frac{1}{8}$	$\frac{3}{16}$	2.20	2.75
17	$1\frac{1}{8}$	$\frac{7}{32}$	2.20	2.75
18	$1\frac{1}{8}$	$\frac{1}{4}$	2.20	2.75
C	$1\frac{1}{8}$	$\frac{5}{16}$	2.20	2.75
19	$1\frac{1}{4}$	$\frac{3}{16}$	2.40	3.20
20	$1\frac{1}{4}$	$\frac{7}{32}$	2.40	3.20
21	$1\frac{1}{4}$	$\frac{1}{4}$	2.40	3.20
D	$1\frac{1}{4}$	$\frac{5}{16}$	2.40	3.20
E	$1\frac{1}{4}$	$\frac{3}{8}$	2.40	3.20
22	$1\frac{3}{8}$	$\frac{1}{4}$	2.70	3.80
23	$1\frac{3}{8}$	$\frac{5}{16}$	2.70	3.80
F	$1\frac{3}{8}$	$\frac{3}{8}$	2.70	3.80
24	$1\frac{1}{2}$	$\frac{1}{4}$	2.70	3.95
25	$1\frac{1}{2}$	$\frac{5}{16}$	2.70	3.95
G	$1\frac{1}{2}$	$\frac{3}{8}$	2.70	3.95

These Cutters are regularly furnished right hand. Left hand cutters or cutters having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering



Angular Cutters

For Cutting the Teeth of Cutters and Mills



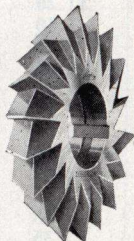
With angles of 45°, 50°, 60°, 70° or 80°

Carbon Steel No. 2168 **High Speed Steel No. 2668**

Diameter	Thickness	Hole	Price Each	
			Carbon Steel	High Speed
2½	½	⅞	\$3.40	\$4.10
2¾	½	1	3.60	4.45
3	½	1¼	4.30	5.40

For Spiral Mills

With angles of 40°, 48° or 53° on one side and 12° on the other



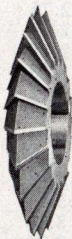
Carbon Steel No. 2268 **High Speed Steel No. 2768**

Diameter	Thickness	Hole	Price Each	
			Carbon Steel	High Speed
2¾	½	⅞	\$3.40	\$4.10
2¾	½	1	3.60	4.45
3	½	1¼	4.30	5.40
*3¼	½	1½	4.80	6.15

*This size furnished only with 53 by 12° angle.

Double Angle Cutters

With included angle of 45°, 60° or 90°



Carbon Steel No. 2169 **High Speed Steel No. 2669**

Diameter	Thickness	Hole	Price Each	
			Carbon Steel	High Speed
2½	½	⅞	\$3.40	\$4.10
2¾	½	1	3.60	4.45
3	½	1¼	4.30	5.40

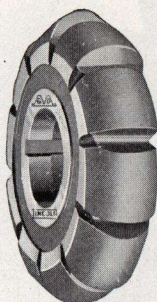
When ordering Angular Cutters, state whether Right or Left Hand Cutters are wanted, and give diameter and angle.

Angular or Double Angle Cutters having dimensions other than listed are special and subject to special prices.

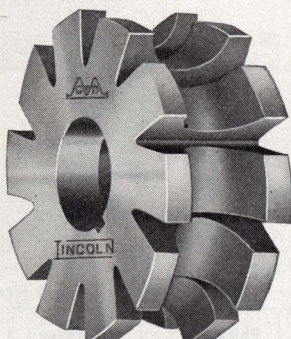
Specify our list number when ordering

Convex and Concave Cutters

For Milling Half Circles



Convex



Concave

Carbon Steel No. 2158

Carbon Steel No. 2258

High Speed Steel No. 2658 High Speed Steel No. 2758

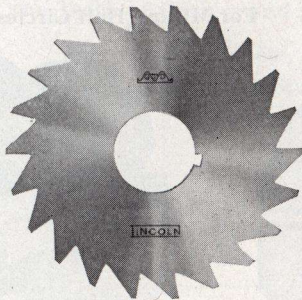
Diameter of Circle	Diameter of Cutter	Hole	Price Each Carbon Steel		Price Each High Speed Steel	
			Convex	Concave	Convex	Concave
$\frac{1}{8}$	2	$\frac{7}{8}$	\$2.10	\$3.35	\$3.15	\$5.00
$\frac{3}{16}$	2	$\frac{7}{8}$	2.45	3.50	3.70	5.35
$\frac{1}{4}$	2	$\frac{7}{8}$	3.10	3.80	4.75	5.70
$\frac{5}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.35	4.10	5.10	6.20
$\frac{3}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.45	4.25	5.25	6.40
$\frac{7}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.60	4.50	5.45	6.85
$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.80	4.80	5.70	7.30
$\frac{5}{8}$	$2\frac{3}{4}$	1	4.65	6.00	7.00	9.00
$\frac{3}{4}$	3	1	5.50	7.00	8.35	10.60
$\frac{7}{8}$	$3\frac{1}{4}$	1	6.45	8.00	9.75	12.10
1	$3\frac{1}{4}$	1	7.00	8.15	10.50	12.40
$1\frac{1}{8}$	4	$1\frac{1}{4}$	9.35	10.80	14.20	16.35
$1\frac{1}{4}$	4	$1\frac{1}{4}$	9.65	11.40	14.65	17.25
$1\frac{3}{8}$	$4\frac{1}{4}$	$1\frac{1}{4}$	10.70	12.85	16.20	19.55
$1\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{1}{4}$	11.00	13.90	16.75	21.10

These Cutters can be sharpened without changing their form.

Convex or Concave Cutters having dimensions other than listed are special and subject to special prices.

Specify our list number when ordering

High Speed Metal Slitting Cutters



High Speed Steel No. 2778

Diameter	Thickness	Hole	Price Each	Diameter	Thickness	Hole	Price Each
2 1/2	1/32	7/8	\$2.50	5	1/16	1	\$3.85
2 1/2	3/64	7/8	2.40	5	3/32	1	3.35
2 1/2	1/16	7/8	2.35	5	1/8	1	3.35
2 1/2	3/32	7/8	2.35	5	1/8	1 1/4	3.35
2 1/2	1/8	7/8	2.35	5	1/8	1 1/2	3.35
2 1/2	5/32	7/8	2.60	5	5/32	1	4.30
				5	3/16	1	4.30
3	1/32	1	2.95				
3	3/64	1	2.60	6	1/16	1	7.50
3	1/16	1	2.50	6	3/32	1	5.85
3	3/32	1	2.50	6	1/8	1	5.35
3	1/8	1	2.50	6	1/8	1 1/4	5.35
3	5/32	1	2.85	6	3/16	1	6.45
				6	3/16	1 1/2	6.45
4	1/32	1	4.60				
4	3/64	1	3.15	7	1/16	1	11.00
4	1/16	1	2.95	7	3/32	1	8.35
4	3/32	1	2.85	7	1/8	1	7.20
4	1/8	1	2.85	7	3/16	1 1/4	9.05
4	5/32	1	3.45	7	3/16	2	9.05
4	3/16	1	3.45				
				8	1/8	1	12.00
				8	1/8	1 1/4	12.00
				8	3/16	1 1/4	12.30
				8	3/16	1 1/2	12.30

The sides of these cutters are ground with proper clearance to leave the cutting edge thicker than any other part of the cutter.

Special cutters, varying from the above dimensions, made to order. Prices on application. When ordering special cutters, please mention the kind of work for which they are intended.

Specify our list number when ordering

High Speed Screw Slotting Cutters



High speed screw slotting cutters are rapidly replacing carbon steel slotters, in every department of manufacturing, where fast, accurate slotting is essential to maximum production.

GTD "Lincoln" were the pioneers in making this radical change in the manufacture of screw slotting cutters, which met at once with universal approbation.

Due to the fact that they are by far the most economical slotter, demand for them is increasing very rapidly. We feel that we are particularly well equipped both in experience and special machinery to produce the highest grade high speed steel screw slotting cutters.

These cutters are regularly made with 44, 56 or 72 teeth though we are in a position to furnish special high speed screw slotting cutters, with differ-

ent numbers or sizes of teeth, together with different sizes of center holes, etc.

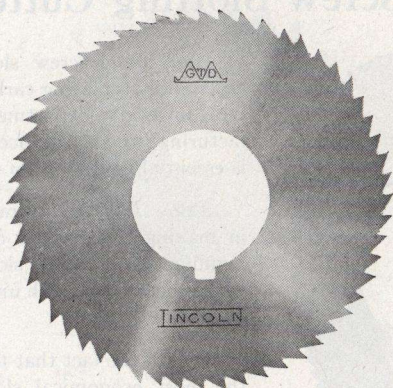
One point *must* always be taken into consideration when changing from the use of carbon steel cutters to that of high speed steel ones,—namely the necessity of increasing the speed at which the cutter is driven from 50 or 75 R.P.M.—which is conventional speed with a carbon steel slotter—to a *minimum* speed of 275 R.P.M., which may be gradually increased until the most suitable one is reached for a given grade of stock.

When ordering, specify the diameter, thickness of cutter, number of teeth, size of center hole and where possible material in which cutter is to be used.

List prices and sizes regularly carried in stock, listed on following page.



High Speed Screw Slotting Cutters



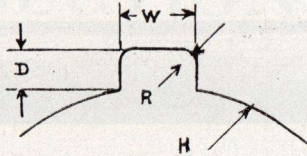
High Speed Steel No. 2678

Gage No. American Standard	Thickness of Cutter in Decimals	Diameter of Cutter	Hole in Cutter	Price Each
6	.162	2 $\frac{3}{4}$	1	\$2.75
7	.144	2 $\frac{3}{4}$	1	2.50
8	.128	2 $\frac{3}{4}$	1	2.25
9	.114	2 $\frac{3}{4}$	1	2.00
10	.102	2 $\frac{3}{4}$	1	1.80
11	.091	2 $\frac{3}{4}$	1	1.60
12	.081	2 $\frac{3}{4}$	1	1.40
13	.072	2 $\frac{3}{4}$	1	1.30
14	.064	2 $\frac{3}{4}$	1	1.20
15	.057	2 $\frac{3}{4}$	1	1.10
16	.051	2 $\frac{3}{4}$	1	1.00
17	.045	2 $\frac{3}{4}$	1	1.00
18	.040	2 $\frac{3}{4}$	1	1.00
19	.035	2 $\frac{3}{4}$	1	1.00
20	.032	2 $\frac{3}{4}$	1	1.00
21	.028	2 $\frac{3}{4}$	1	1.00
22	.025	2 $\frac{3}{4}$	1	1.00
23	.023	2 $\frac{3}{4}$	1	1.00
24	.020	2 $\frac{3}{4}$	1	1.00

Cutters varying from the above sizes made to order. Prices on application.

Specify our list number when ordering

Standard Keyways for Cutters



Diameter of Hole H	Width of Key W	Depth D	Radius R
$\frac{3}{8}$ to $\frac{9}{16}$	$\frac{3}{32}$	$\frac{3}{64}$	.020
$\frac{5}{8}$ to $\frac{7}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	.030
$1\frac{5}{16}$ to $1\frac{1}{8}$	$\frac{5}{32}$	$\frac{5}{64}$	.035
$1\frac{3}{16}$ to $1\frac{3}{8}$	$\frac{3}{16}$	$\frac{3}{32}$	.040
$1\frac{7}{16}$ to $1\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	.050
$1\frac{3}{16}$ to 2	$\frac{5}{16}$	$\frac{5}{32}$	.060
$2\frac{1}{16}$ to $2\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	.060
$2\frac{9}{16}$ to 3	$\frac{7}{16}$	$\frac{3}{16}$	.060

Cutters having keyways other than shown above are special and subject to special prices.

Suggestions for Ordering Cutters

Give catalog number for general style of tool required.

State diameter, face, size of hole and keyway.

State whether right or left hand, straight or spiral cut, and for end mills, give shank, whether Morse or Brown & Sharpe, and number.

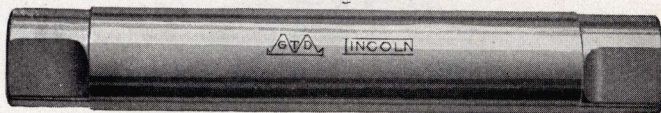
With orders for special cutters, send sketches giving all dimensions and as much information as possible to avoid error and delay.

Orders for special cutters are not subject to cancellation.



Steel Mandrels

Hardened and Ground



No. 90

Diam- eter	Price Each	Length Overall	Diam- eter	Price Each	Length Overall
$\frac{1}{4}$	\$0.80	$3\frac{3}{4}$	$1\frac{15}{16}$	\$6.00	$10\frac{3}{4}$
$\frac{5}{16}$	.90	4	2	6.50	11
$\frac{3}{8}$	1.00	$4\frac{1}{4}$	$2\frac{1}{16}$	7.00	$11\frac{1}{2}$
$\frac{7}{16}$	1.10	$4\frac{1}{2}$	$2\frac{1}{8}$	7.50	$11\frac{1}{2}$
$\frac{1}{2}$	1.20	5	$2\frac{3}{16}$	8.00	12
$\frac{9}{16}$	1.30	$5\frac{1}{4}$	$2\frac{1}{4}$	8.50	12
$\frac{5}{8}$	1.40	$5\frac{1}{2}$	$2\frac{5}{16}$	9.00	12
$\frac{11}{16}$	1.50	$5\frac{3}{4}$	$2\frac{3}{8}$	9.50	12
$\frac{3}{4}$	1.60	6	$2\frac{1}{2}$	10.00	$12\frac{1}{2}$
$\frac{13}{16}$	1.70	$6\frac{1}{4}$	$2\frac{1}{2}$	10.50	$12\frac{1}{2}$
$\frac{7}{8}$	1.85	$6\frac{1}{2}$	$2\frac{9}{16}$	11.25	$12\frac{1}{2}$
$1\frac{15}{16}$	2.00	$6\frac{3}{4}$	$2\frac{5}{8}$	12.00	$12\frac{1}{2}$
1	2.15	7	$2\frac{11}{16}$	12.75	13
$1\frac{1}{16}$	2.30	$7\frac{1}{4}$	$2\frac{3}{4}$	13.50	13
$1\frac{1}{8}$	2.45	$7\frac{1}{2}$	$2\frac{13}{16}$	14.25	13
$1\frac{3}{16}$	2.60	$7\frac{3}{4}$	$2\frac{7}{8}$	15.00	13
$1\frac{1}{4}$	2.80	8	$2\frac{15}{16}$	15.75	13
$1\frac{5}{16}$	3.00	$8\frac{1}{4}$	3	16.50	13
$1\frac{3}{8}$	3.25	$8\frac{1}{2}$	$3\frac{1}{8}$	18.00	14
$1\frac{7}{16}$	3.50	$8\frac{3}{4}$	$3\frac{1}{4}$	19.50	14
$1\frac{1}{2}$	3.75	9	$3\frac{3}{8}$	21.00	15
$1\frac{9}{16}$	4.00	$9\frac{1}{4}$	$3\frac{1}{2}$	23.00	15
$1\frac{5}{8}$	4.25	$9\frac{1}{2}$	$3\frac{5}{8}$	25.00	16
$1\frac{11}{16}$	4.50	$9\frac{3}{4}$	$3\frac{3}{4}$	27.00	16
$1\frac{3}{4}$	4.75	10	$3\frac{7}{8}$	29.00	17
$1\frac{13}{16}$	5.00	$10\frac{1}{4}$	4	31.00	17
$1\frac{7}{8}$	5.50	$10\frac{1}{2}$			

These Mandrels correspond in size to our Reamers, and will fit holes reamed by them. They are slightly tapered, and the size is stamped on the large end. All sizes and dimensions not listed are special and subject to special prices.

Specify our list number when ordering

PIPE TOOL SECTION

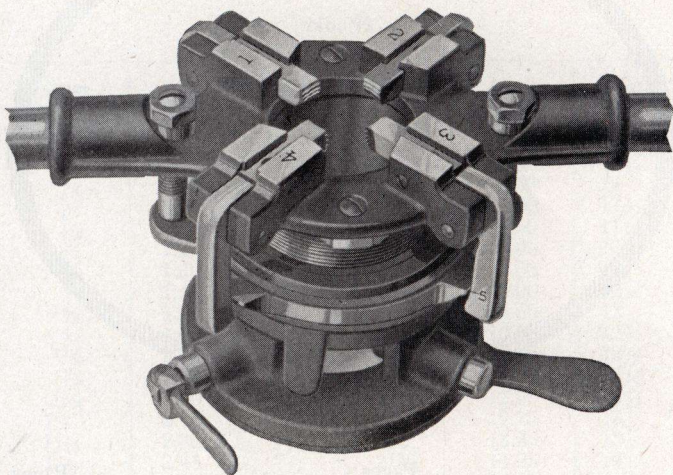
Stocks and Dies
Pipe Wrenches
Pipe Vises
Pipe Cutters

	Pages		Pages
Bit Brace Stocks and Dies	304	Plumbers' Screw Plates	304
Brass Tubing Sets	293	Ratchet Stocks and Dies	303
Cutters	307	Reamers	100
"Duo" Stock	289	Receders	280-285
"Little Giant" Stocks and Dies	290-292	Taps	100
"Little Giant" Full Mounted	294, 295	"Trio" Stock	286-288
"OK" Stocks and Dies	296	Vise	306
Pipe Tool Sets	297	Wrenches—Pipe	305
		Wrenches—Tap	112, 113

**GTD**

Receding Pipe Threader

Patented June 10, 1919



Capacity 1" to 2" Pipe



No Unwinding--On the Pipe, or Off

The **GTD** Receder has advantages not found in other similar tools. Some of the important features are the lead screw and opening lead nut, the narrow milled chasers and quick adjustment.

On the following pages will be found a detailed description of these features and the reasons for our slogan "No unwinding, on the pipe or off."



Receding Pipe Threader

The **GTD** Receding Pipe Threader does away with the wedging action of tapered pipe dies. It does away with unwinding, on the pipe or off. It does away with 80% of the friction generated by ordinary dies.

"The **GTD** Receder," as it is commonly known, has two special features which stand out prominently, viz.:

QUICK RELEASE—QUICK RETURN

When the cut is finished, release the chuck and pull the "Receder" straight off the pipe,—no unwinding.

No unwinding is necessary to return the "Receder" to its original cutting position. Release the lead screw, lift the head, reset trigger and begin another cut. No unwinding—on the pipe or off.

The **GTD** Receder has the easiest cutting combination that modern inventive ingenuity has been able to evolve.

SPECIAL DETAILS OF CONSTRUCTION

Narrow Chasers

None but the actual cutting teeth follow around in the threads. These chasers travel along the pipe parallel to the thread they are cutting and not parallel to the axis of the pipe. This eliminates considerable friction.

Relieved Milled Chasers

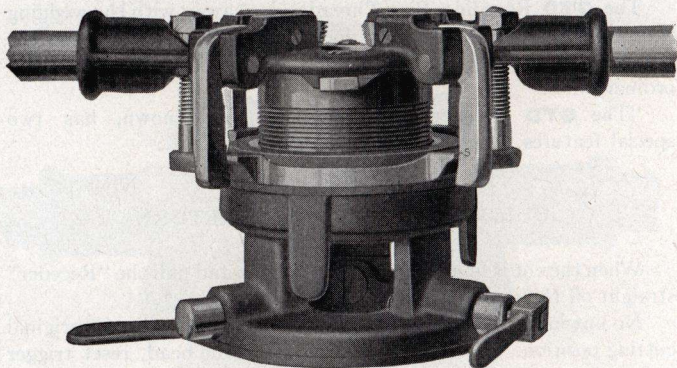
Perfectly relieved, having the right clearance back of the cutting edge, the friction caused by rubbing is further reduced.

Interchangeable Chasers

These are milled in such a manner as to permit the replacement of a single Chaser, should one be lost or broken. The replaced Chaser will follow or track with the balance of the set, which makes it unnecessary to buy a full set of Chasers on account of the loss of one. This is a welcome economy.

GTD

Receding Pipe Threader



Showing position of "Receder" when ready to thread

Receding Action

At the beginning the chasers cut a full depth thread. As the work progresses the levers which support the chasers gradually change their position, permitting the chasers to recede until they have finally backed completely away from the pipe. The threader then can be pulled straight off the pipe, avoiding expensive unwinding.

Resetting

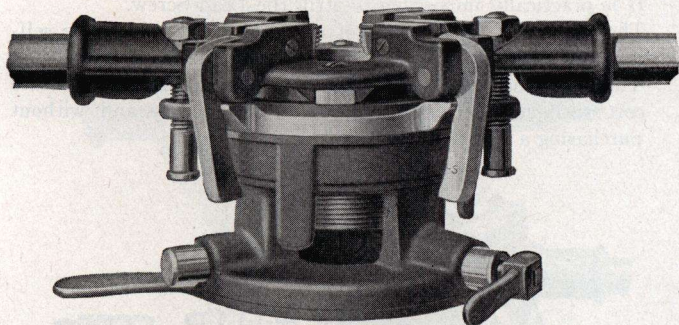
Unwinding a lead screw after a thread is cut is time thrown away. Recognizing this, we have made the GTD Receder with a quick release and a quick resetting feature. A turn of any one of three conveniently placed lugs disengages the lead screw, so that the head may be lifted or pulled straight back to original position, and reset there.

Adjustment

The Receder is adjustable for shallow or deep threads. Adjustment is made easily by changing the setting of the lock nut and adjusting rods that project through the head of the threader.

GTD

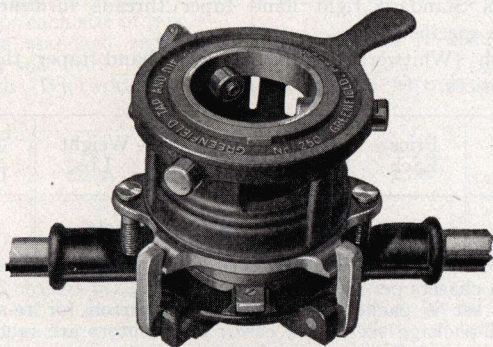
Receding Pipe Threader



Showing position of "Receder" when cut is finished

The Chuck

The GTD Receder has a 3-jaw universal chuck guide. After the jaws are tightened against the pipe, one turn of a grip screw working inside of a chuck jaw completes the bite that simply cannot slip. These jaws open wide enough to take in a coupling of the largest pipe-size within the range of the Receder.



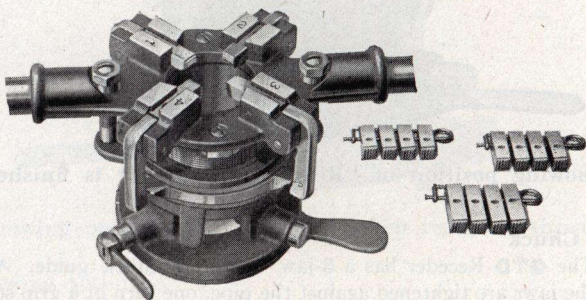
Universal Self-Locking Chuck

GTD

Receding Pipe Threader

Replaceable Lead Screw and Lead Nut

It is practically impossible to strip the Lead Screw. The Lead Nut is made up of three segments which are self-cleaning. No dirt or chips can gather on the Lead Screw. The Lead Screw and Lead Nut are replaceable at a moderate cost without returning the tool to the factory and without purchasing a new head or body.



No. 250

Regularly furnished with one Threader and one set of narrow chasers for each size of pipe.

Briggs Standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

No.	Price Each	Cutting Sizes	Weight Lbs.	Length Stock Inches
250	\$30.00	1, 1¼, 1½, 2"	16	47

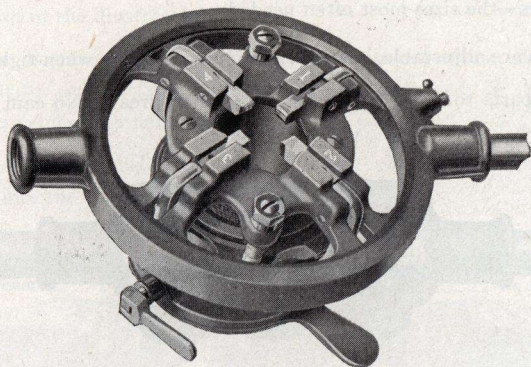
Extra chasers per set, \$2.50, per size.

Each set is packed in a substantial carton for re-shipment. Standard package six to the case. Distributors are requested to order these quantities or multiples.

Repair parts listed on page 298.

GTD

Ratchet Receding Pipe Threader



No. 250 R

For threading in trenches, corners or near walls the **GTD** Ratchet Receder is provided.

It will swing in a 14" circle. In its general arrangement it is identical with the regular Receder. The ratchet mechanism is the only change and is a part of the stock, not an attachment.

The head is so arranged that the pulling strain of the handles comes directly back of and in line with the chasers, minimizing the pull and preventing any danger of twisting strains.

The threader has two handle lugs. Two handles are shipped with it. It can be used either with or without the Ratchet.

Regularly furnished with one Threader and one set of narrow chasers for each size of pipe.

Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand threads at regular prices.

No.	Price Each	Cutting Sizes	Weight Lbs.	Length Stock Inches
250R	\$36.00	1, 1¼, 1½, 2"	30	47

Extra chasers per set, \$2.50 per size.

Each set is packed in a substantial carton for re-shipment. Standard package six to the case. Distributors are requested to order these quantities or multiples.

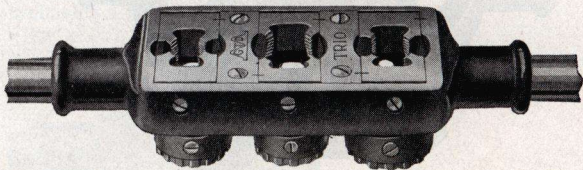
Repair parts listed on page 298.

"Trio" Die Stocks

A light, compact die stock holding three sizes of "*Little Giant*" pipe dies—the sizes most often needed.

Dies are adjustable, yet are rigidly held in place when tightened.

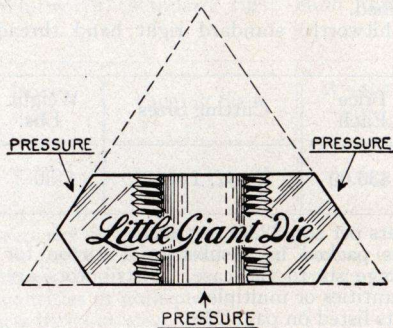
No parts to lose. No exposed screws to break. No cam plates to adjust.



Sizes needed are in the stock all the time. It is impossible to forget dies or bushings. No chance to lose them.

Handles are detachable and the whole outfit fits an ordinary kit bag.

Valuable for outside work where the workman may need several sizes of dies. Equally valuable in the shop—3 sizes always ready. No changing of dies, no need to adjust for each cut.

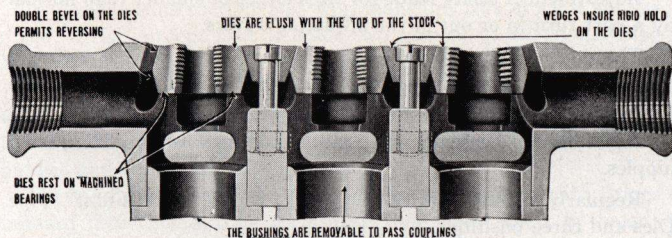


"Trio" Die Stocks

The common sense simplicity of the "Trio" and "Duo" Die Stocks is shown in the illustration.

The dies are the famous "Little Giant" brand which have been popular for over forty years because of their accuracy in threading and convenience in handling.

The dies are held rigidly by a three angle grip — called by mechanics the surest grip known.

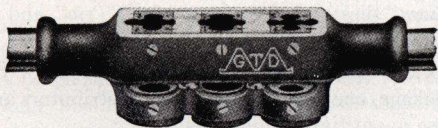


Cross Section of "Trio" showing arrangement of Dies and Bushings

The dies rest on machined bearings. Tightening the wedges tightens the pressure on the beveled surfaces, so that the whole is practically as rigid as a solid piece.

Yet they are easily removed.

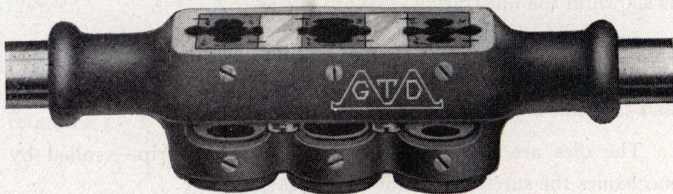
Standard marks on dies and stocks, show the exact position for normal cutting size.





"Trio" Die Stocks

For Pipe



Adjustment is easily made for sizes larger or smaller than normal by a part turn in or out of the adjusting screws.

The double bevel on the dies permits reversing when a thread must be cut close to a wall or other obstruction. The stock can then be threaded on face first.

Bushings can be removed to clear couplings for threading close nipples.

Regularly furnished with one stock, three "*Little Giant*" Pipe Dies and three bushings.

Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

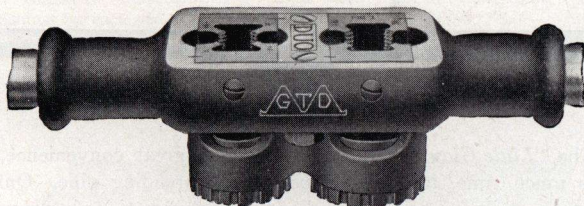
No.	Price Each	Cutting Sizes	Weight Lbs.	Length Stock Inches
200A	\$8.50	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ "	4½	28
200B	8.50	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	4½	28
210A	11.00	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ "	10	40
210B	11.00	$\frac{1}{2}$, $\frac{3}{4}$, 1"	10	40

"*Little Giant*" dies and extra parts for "*Trio*" and "*Duo*" Die Stocks are listed on page 299.

Each stock is packed in a substantial carton for re-shipment. Standard package, one dozen to the case. Distributors are requested to order these quantities or multiples.

"Duo" Die Stocks

For Pipe



In design, construction and workmanship, this stock is similar to the "Trio", except that it holds two sizes of "Little Giant" Pipe Dies instead of three.

The dies are adjustable and can be reversed in the collet to cut a close thread. The bushings are removable to pass couplings, etc. The dies rest on machined bearings. These bearings support the dies and insure accurate alignment.

The handles in "Trio" and "Duo" stocks are threaded with Briggs standard pipe thread, thus permitting their easy repair if threads should become stripped.

Regularly furnished with one stock, two "Little Giant" Pipe Dies and two bushings.

Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

No.	Price Each	Cutting Sizes	Weight Lbs.	Length Stock Inches
220A	\$8.50	$\frac{1}{2}$, $\frac{3}{4}$ "	7½	26
220B	8.50	$\frac{3}{4}$, 1"	7½	26

"Little Giant" Dies and extra parts for "Trio" and "Duo" Die Stocks are listed on page 299.

Each stock is packed in a substantial carton for re-shipment. Standard package, one dozen to the case. Distributors are requested to order these quantities or multiples.

Little Giant Stocks and Dies

For Pipe



The "*Little Giant*" Adjustable Die is a great convenience. It saves much time, money and bother in threading pipe. Only a minute is needed to adjust the die for slight variations in diameter.

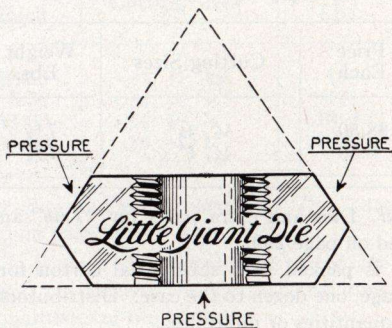
The dies are reversible to cut close to a shoulder, wall or other obstruction and to cut close nipples. The bushings are also removable to pass couplings, etc.

The dies can be set quickly to cut larger or smaller threads. A slight turn of each of the adjusting screws pressing against the dies gives the adjustment. Standard marks on stock and dies make quick resetting possible.

The illustration shows the construction. Simplicity is the feature. The dies are wedged by the beveled surfaces and when tightened are as solid as square dies.

The steel in these dies is made from our own formula for high grade crucible tool steel. A special heat treatment refines and toughens the steel, making the dies long lived and easy cutting.

These stocks and dies, as well as all other GTD pipe tools, are given a thorough inspection and are fully guaranteed.



Little Giant Stocks and Dies

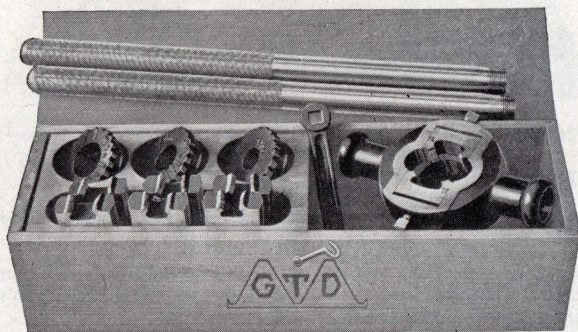
For Pipe

Regularly furnished with a "Little Giant" stock, "Little Giant" Dies and Bushings for each size.

Briggs standard right hand taper threads furnished unless otherwise ordered.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.



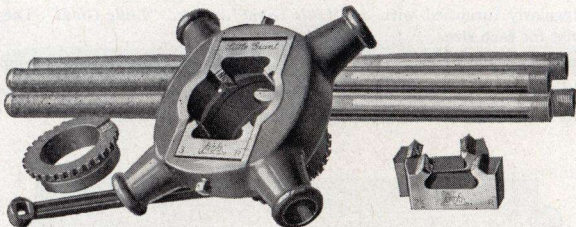
No.	260	261A	261B	261C	261½A	261½B	262A	262B
Cutting Sizes	$\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$	$\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1	$\frac{1}{2}$ $\frac{3}{4}$ 1	$\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1	$\frac{1}{2}$ $\frac{3}{4}$ 1 1½	$\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 1½	$\frac{1}{4}$ $\frac{1}{2}$ 1½ 2	1 1½ 1½ 2
Length of Stock In.	22	36	36	36	41	41	51	51
Net Weight Lbs.	6	12	10	13	12	18	26	29
Price Dollars	9.00	12.00	9.00	14.00	14.00	19.00	18.00	21.00
Standard Package	6	6	6	6	3	3	3	3

Taps for these assortments are listed on page 100.

"Little Giant" dies and extra parts for these assortments are listed on page 300.

Little Giant Stocks and Dies

For Pipe



- No. 263A. Each \$35.00. Cutting: $2\frac{1}{2}$ ". Stock 66" long, 1 Die and 1 Bushing. Weight 40 lbs.
 No. 263B. Each \$35.00. Cutting: 3". Stock 66" long, 1 Die and 1 Bushing. Weight 40 lbs.
 No. 263C. Each \$45.00. Cutting: $2\frac{1}{2}$, 3". Stock 66" long, 2 Dies and 2 Bushings. Weight 44 lbs.

These stocks packed one to the case. Handles crated separately.

For British Conduit

These sets are designed especially for threading British conduit. The stocks and dies are of the same design as are furnished in other "*Little Giant*" sets of screwing tackle.

The dies are readily changed from one cutting size to another. This is done by simply unscrewing the guide, when the dies can be lifted from the stock. The three assortments allow the purchaser a variety of sizes from which those most often needed can be selected.

Regularly furnished with a "*Little Giant*" stock, "*Little Giant*" Dies and Bushings for each size. Whitworth standard right hand straight threads furnished unless otherwise ordered.

Assortments and Prices

- No. S260A Each \$7.25. Cutting: $\frac{1}{2}$ ¹⁸, $\frac{5}{8}$ ¹⁸, $\frac{3}{4}$ ¹⁶. Stock 22" long, Dies and Bushings for each cutting size. Weight $5\frac{1}{2}$ lbs.
 No. S261A Each \$12.00. Cutting: $\frac{1}{2}$ ¹⁸, $\frac{5}{8}$ ¹⁸, $\frac{3}{4}$ ¹⁶, $\frac{7}{8}$ ¹⁶, 1"¹⁶. Stock 32" long, Dies and Bushings for each cutting size. Weight 12 lbs.
 No. S261D Each \$9.00. Cutting: $\frac{5}{8}$ ¹⁸, $\frac{3}{4}$ ¹⁶, 1"¹⁶. Stock 36" long, Dies and Bushings for each cutting size. Weight 10 lbs.
 No. S261E Each \$9.00. Cutting: $\frac{3}{4}$ ¹⁶, 1"¹⁶, $1\frac{1}{4}$ ¹⁶. Stock 36" long, Dies and Bushings for each cutting size. Weight 10 lbs.
 No. S262C Each \$18.00. Cutting: $1\frac{1}{4}$ ¹⁶, $1\frac{1}{2}$ ¹⁴, 2"¹⁴. Stock, 51" long, Dies and Bushings for each cutting size. Weight 26 lbs.

"*Little Giant*" Dies and extra parts for these assortments are listed on page 300.

Little Giant

Screw Plates for Brass Tubing



The taps and dies in these sets cut straight threads (not taper) and the tubing on which they are used is measured on the outside diameter instead of the inside as is the case with ordinary pipe.

Regularly furnished for cutting American Standard (27 threads per inch) but English Standard Threads (26 threads per inch) can be supplied at same prices.

No.	214	215	216	217	218	219
Cutting Sizes	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1	$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1
Collets Diam. Inches	2	2	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$
Stock, Length Inches	$14\frac{1}{2}$	$14\frac{1}{2}$	23	23	26	26
Tap Wrench No.		5		6		5, 7
Price, Dollars	14.00	18.50	20.50	27.50	28.50	42.00

Nos. 214, 216 and 218 have no taps nor tap wrenches.

Nos. 215, 217 and 219 contain plug taps and tap wrenches.

Taps for these assortments listed on page 85.

"Little Giant" Dies and parts for these assortments are listed on page 127.

Each assortment is fitted in a handsome hardwood case. Standard package three sets to the shipping case. Distributors are requested to order these quantities or multiples.

Full Mounted Die Stocks

With *Little Giant* Dies for Pipe



The "*Little Giant*" Pipe Dies furnished with these die stocks have the "double bevel" (Patented Feb. 23, 1915). This permits the reversing of the dies so that work can be threaded through the bushing or close to the face.

The length of the handles is in proportion to the size of the die.

Regularly furnished with one stock, one set of "*Little Giant*" Taper Pipe Dies, and one bushing, each size being mounted in its own stock.

Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

No.	Price Each	Cutting Size	Die Blank Used	Weight Stock Lbs.	Length Stock Inches
280	\$3.00	$\frac{1}{8}$	$\frac{1}{4}$ Bolt	$1\frac{1}{2}$	$9\frac{1}{2}$
281	3.00	$\frac{1}{4}$	$\frac{3}{8}$ Bolt	$1\frac{1}{2}$	14
282	4.00	$\frac{3}{8}$	No. 0 Pipe	3	22
283	4.00	$\frac{1}{2}$	No. 0 Pipe	3	25
284	5.00	$\frac{3}{4}$	No. 1 Pipe	5	32
285	5.00	1	No. 1 Pipe	$5\frac{1}{2}$	36
286	6.50	$1\frac{1}{4}$	No. $1\frac{1}{2}$ Pipe	7	40
287	10.50	$1\frac{1}{2}$	No. 2 Pipe	12	51
288	10.50	2	No. 2 Pipe	$14\frac{1}{2}$	51

See opposite page for combination assortments of "*Little Giant*" Full Mounted Die Stocks.

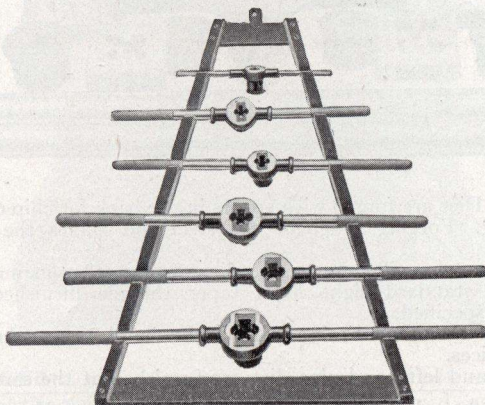
Taps for these sets are listed on page 100.

"*Little Giant*" Dies and extra parts for these stocks are listed on page 301.

Each die stock is packed in a slide cover box. Nos. 280-284 inclusive are packed one dozen to the case. Nos. 285-288 inclusive are packed six to the case. Distributors are requested to order these quantities or multiples.

Full Mounted Die Stock Assortments

With *Little Giant* Dies for Pipe



A handsomely finished hardwood rack is furnished with each assortment.

For convenience in shipping, rack is knocked down and packed with the stocks in a plain durable case.

Regularly furnished with one stock, one set of "*Little Giant*" Taper Pipe Dies and one bushing for each size, mounted in individual stocks.

Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

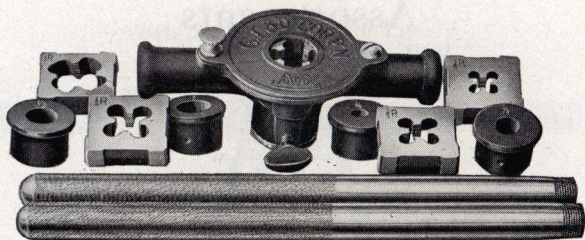
Asst. No.	Price including Rack	Assortments	Wt. Lbs.
271	\$14.00	4 Stocks, No. 280, $\frac{1}{8}$ "; No. 281, $\frac{1}{4}$ "; No. 282, $\frac{3}{8}$ "; No. 283, $\frac{1}{2}$ "	11
272	21.00	5 Stocks, No. 281, $\frac{1}{4}$ "; No. 282, $\frac{3}{8}$ "; No. 283, $\frac{1}{2}$ "; No. 284, $\frac{3}{4}$ "; No. 285, 1"	21
273	27.00	6 Stocks, No. 281, $\frac{1}{4}$ "; No. 282, $\frac{3}{8}$ "; No. 283, $\frac{1}{2}$ "; No. 284, $\frac{3}{4}$ "; No. 285, 1"; No. 286, $1\frac{1}{4}$ "	24
274	46.00	8 Stocks, No. 281, $\frac{1}{4}$ "; No. 282, $\frac{3}{8}$ "; No. 283, $\frac{1}{2}$ "; No. 284, $\frac{3}{4}$ "; No. 285, 1"; No. 286, $1\frac{1}{4}$ "; No. 287, $1\frac{1}{2}$ "; No. 288, 2"	58

Taps for these assortments are listed on page 100.

Individual die stocks for these assortments are listed on opposite page.

"OK" Stocks and Dies

For Pipe



"OK" Dies are forged with spaces in the back for chip clearance and oiling. Forging toughens the steel and makes the die cut easier.

These stocks will take square dies of any other manufacturer. Briggs standard right hand taper threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

No.	0	1	1A	1B	1½	1½A	1½B	2	2A	2B	3
Cutting Sizes	⅛ ¼ ⅜ ½	¼ ⅜ ½ ¾ 1	½ ¾ 1	⅛ ¼ ⅜ ½ ¾ 1	¾ 1 1¼	½ ¾ 1 1¼	¼ ⅜ ½ ¾ 1 1¼		1 1¼ 1½ 2	½ ¾ 1 1¼ 1½ 2	2½ 3
Size of Dies	2 x 2 x ½	2½ x 2½ x ¾			3 x 3 x ¾			4 x 4 x ⅞			5 x 5 x 1¼
Net Wt. lbs.	7	13	11	14	20	23	22	25	28	30	72
Price Dollars	8.00	10.50	7.50	12.00	9.50	11.50	15.50	14.50	17.00	22.00	42.00
Std. Package	6	6	6	6	6	6	6	3	3	3	3

Regularly furnished with one Malleable Stock, "OK" Forged Taper Pipe Dies and Bushings for each size in plain hinged box. Nos. 2, 2A, 2B and 3 furnished with a lead screw.

"OK" Square Dies and extra parts for above assortments are listed on page 302.

Taps for these assortments are listed on page 100.

GTD Pipe Tool Sets



The **GTD** Pipe Tool Sets are made up of the same tools as are shown elsewhere in this catalog.

Nos. FF and G are recommended for use as Household Sets. They comprise all tools necessary for any ordinary job of piping for water, gas, etc. around house or farm.

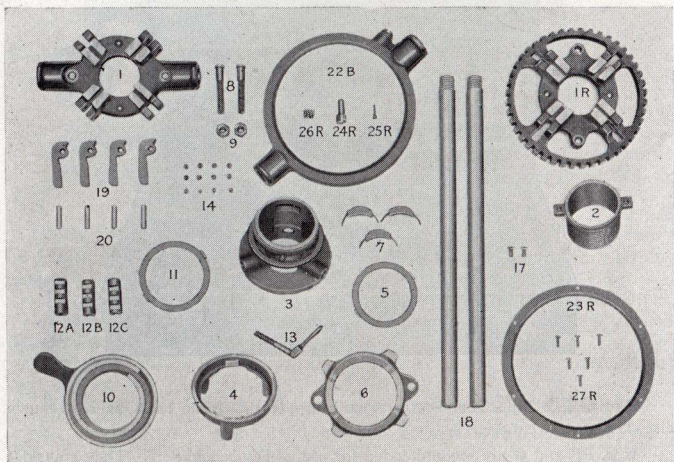
No.	A	B	D	FF	G
Cutting Sizes	1 Set No. 1 "OK" Stocks and Dies $\frac{1}{4}$ " to 1"	1 Set No. 1 $\frac{1}{2}$ " "OK" Stocks and Dies $\frac{1}{4}$ " to $1\frac{1}{4}$ "	1 Set No. 1 "OK" Stocks and Dies $\frac{1}{4}$ " to 1" 1 Set No. 2 "OK" Stocks and Dies $1\frac{1}{4}$ " to 2"	1 Set No. 0 "OK" Stocks and Dies $\frac{1}{8}$ " to $\frac{1}{2}$ "	1 Set No. 1 "OK" Stocks and Dies $\frac{1}{4}$ " to 1"
Pipe Wrench Size Inches	14	14	18	10	10
Pipe Cutter No.	1	1	2	1	1
Pipe Vise No.	1	1	1	0	0
Price Dollars	23.50	25.00	38.00	16.00	18.00

Nos. A, B, and D contain each one oil can and one can pipe joint cement.

Repairs for the tools furnished in these sets are listed on the following pages. "OK" Stocks and Dies, page 302. Pipe Wrenches page 305. Combination Pipe Cutters page 307. Hinged Pipe Vises page 306.

Repairs for GTD Receders

Nos. 250 and 250R



Avoid mistakes. Order by number.

Specify for No. 250 or 250R Receder.

No. of P't	Name of Part	Price	No. of P't.	Name of Part	Price
1	Head	\$4.00	14	Die retaining Ball, Spring and Screw (1 ea.)	\$.20
2	Lead Screw	1.30	17	Lead Screw Screws, each	.10
3	Body	2.50	18	Handles (per pair)	2.00
4	Lead Box	1.50	19	Cam Levers, each	.40
5	Lower Nut	.50	20	Lever Pins, each	.10
6	Form Ring	2.00	1R	Ratchet Head	5.00
7	Lead Nut Segments per set (3)	1.50	22R	Ratchet Band	3.50
8	Adjusting Rods (2)	.70	23R	Ratchet Plate	1.00
9	Adjusting Nuts (2)	.20	24R	Ratchet Pawl	.50
10	Scroll Plate	2.50	25R	Ratchet Pawl Pin	.10
11	Upper Nut	.50	26R	Ratchet Spring	.20
12A	Chuck Jaw (tapped)	.60	27R	Ratchet Plate Screw each	.10
12B	Chuck Jaw	.50			
12C	Chuck Jaw	.50			
13	Grip Screw & Handle	.30			

Complete Tools using these parts are shown on pages 280 to 285.

Repairs for "Trio" and "Duo" Die Stocks

Little Giant Dies

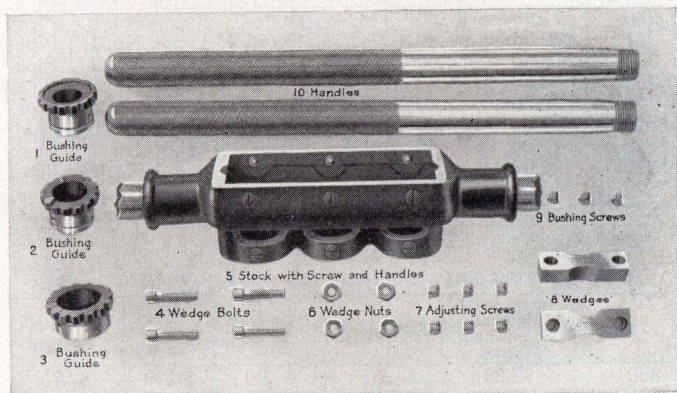
When ordering Dies, mention the stock by number.

Briggs standard right hand taper pipe threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper pipe threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

Stock No.	Dies Each	Bushings Each	Cutting Sizes	Blank Used
200	\$1.60	\$.30	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	No. 0 Pipe
210	2.00	.40	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1"	No. 1 Pipe
220	2.00	.40	$\frac{1}{2}$, $\frac{3}{4}$, 1"	No. 1 Pipe



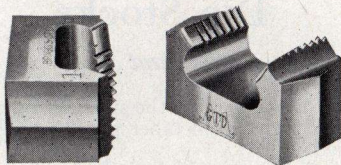
Stocks

When ordering repairs, mention stock by number.

Stock No.	Stock with Screws and Handles	Wedges Each	Wedge Bolts and Nuts	Bushing Screws	Adjusting Screws	Handles Per Pair
200	\$4.00	\$.30	\$.30	\$.20	\$.20	\$.75
210	5.50	.50	.35	.25	.25	1.25
220	5.00	.50	.35	.25	.25	1.25

Complete assortments using these parts are shown on pages 286 to 289.

Repairs for *Little Giant* Stocks and Dies



Little Giant Dies

When ordering "*Little Giant*" dies, mention the stock by number. Briggs standard right hand taper pipe threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper pipe threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

Set No.	Dies Each	Bushings Each	Cutting Sizes	Blank Used
260	\$1.60	\$.30	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	No. 0 Pipe
261	2.00	.40	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1"	No. 1 Pipe
261 $\frac{1}{2}$	3.50	.60	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{4}$ "	No. 1 $\frac{1}{2}$ Pipe
262	4.50	.75	1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, 2"	No. 2 Pipe
263	10.00	2.00	2 $\frac{1}{2}$, 3"	No. 3 Pipe
*S260A	1.60	.30	$\frac{1}{2}$ ¹⁸ , $\frac{5}{8}$ ¹⁸ , $\frac{3}{4}$ ¹⁶	No. 0 Pipe
*S261A	12.00	.40	$\frac{1}{2}$ ¹⁸ , $\frac{5}{8}$ ¹⁸ , $\frac{3}{4}$ ¹⁶ , $\frac{7}{8}$ ¹⁶ , 1 ¹⁶	No. 1 Pipe
*S261D	2.00	.40	$\frac{5}{8}$ ¹⁸ , $\frac{3}{4}$ ¹⁶ , 1 ¹⁶	No. 1 Pipe
*S261E	2.00	.40	$\frac{3}{4}$ ¹⁶ , 1 ¹⁶ , 1 $\frac{1}{4}$ " ¹⁶	No. 1 Pipe
*S262C	4.50	.75	1 $\frac{1}{4}$ ¹⁶ , 1 $\frac{1}{2}$ ¹⁴ , 2" ¹⁴	No. 2 Pipe

Little Giant Stocks

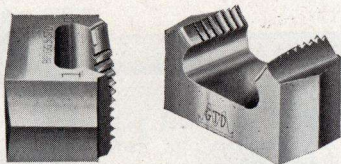
When ordering parts, mention the stock by number.

No.	Stock with Handles Screws and Wrench	Guide	Adjusting Screws Each	Bushing Screws Each	Handles Per Pair
260	\$3.25	\$.70	\$.20	\$.20	\$.75
261	4.00	1.00	.25	.25	1.25
261 $\frac{1}{2}$	5.25	1.10	.35	.35	2.25
262	7.00	1.50	.40	.40	2.50
263	25.00	2.50	.40	.40	7.00
*S260A	3.25	.70	.20	.20	.75
*S261A	4.00	1.00	.25	.25	1.25
*S261D	4.00	1.00	.25	.25	1.25
*S261E	4.00	1.00	.25	.25	1.25
*S262C	7.00	1.50	.40	.40	2.50

Complete assortments using these parts are listed on pages 290 to 292.

*These parts are for the British Conduit assortments listed on page 292. Whitworth standard right hand straight threads furnished unless otherwise ordered.

Repairs for *Little Giant* Full Mounted Die Stocks



Little Giant Dies

When ordering dies, mention the stock by number.

Briggs standard right hand taper pipe threads furnished unless otherwise specified.

British (Whitworth) standard right hand taper pipe threads at regular prices.

Right and left hand pipe dies are furnished at the same list.

Stock No.	Price Dies Each	Bushings Each	Cutting Sizes	Blank Used
280	\$1.50	\$.20	$\frac{1}{8}$	$\frac{1}{4}$ " Bolt
281	1.50	.20	$\frac{1}{4}$	$\frac{3}{8}$ " Bolt
282	1.60	.30	$\frac{3}{8}$	No. 0 Pipe
283	1.60	.30	$\frac{1}{2}$	No. 0 Pipe
284	2.00	.40	$\frac{3}{4}$	No. 1 Pipe
285	2.00	.40	1	No. 1 Pipe
286	3.50	.60	$1\frac{1}{4}$	No. $1\frac{1}{2}$ Pipe
287	4.50	.75	$1\frac{1}{2}$	No. 2 Pipe
288	4.50	.75	2	No. 2 Pipe

Full Mounted Stocks

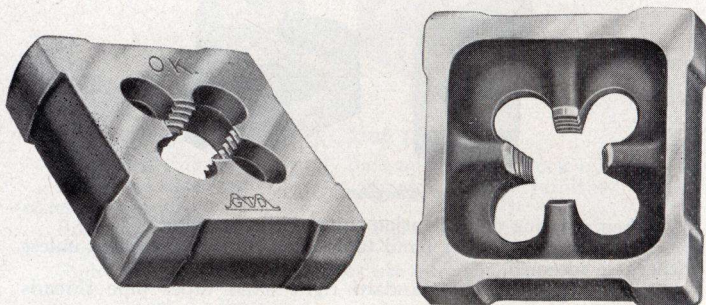
When ordering repairs, mention the stock number and size.

No.	Stock with Handles, Screws and Wrench	Guide with Bushing Screw	Adjusting Screws Each	Bushing Screws Each	Handles per Pair
280	\$2.00	\$1.00	\$.20	\$.20	
281	2.00	1.00	.20	.20	
282	3.25	1.00	.20	.20	\$.75
283	3.25	1.00	.20	.20	.75
284	4.00	1.50	.25	.25	1.25
285	4.00	1.50	.25	.25	1.25
286	5.25	1.75	.35	.35	2.25
287	7.00	2.00	.40	.40	2.50
288	7.00	2.00	.40	.40	2.50

Stocks and assortments using these parts are listed on pages 294 and 295.

Repairs for "OK" Square Pipe Stocks

Patented Dec. 31, 1912



"OK" DIES

When ordering "OK" Dies mention the stock by number.

These dies will fit square die stocks of any manufacture.

Briggs standard right hand taper pipe threads furnished unless otherwise specified.

British (Whitworth) right hand taper pipe threads furnished at regular prices.

Right and left hand pipe dies are furnished at the same list.

No.	Dies Each	Bushings	Cutting Sizes	Size of Square Inches	Thick-ness In.
0	\$1.40	\$0.30	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	2	$\frac{1}{2}$
1	1.60	.40	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1"	2½	$\frac{3}{4}$
1½	2.00	.60	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1¼"	3	$\frac{3}{4}$
2	2.50	.75	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1¼, 1½, 2"	4	$\frac{7}{8}$
3	9.00	2.00	2½, 3"	5	1¼

"OK" STOCKS

When ordering, mention Die Stock by number.

No.	Stocks	Handles per Pair	Name Plates	Screws	Die Frames
0	\$3.00	\$0.75	\$0.40	\$0.20	
1	3.50	1.25	.60	.30	\$0.30
1½	4.00	1.50	.80	.30	.40
2	8.50	2.00	1.00	.50	.80
3	26.00	3.50	1.25	.75	1.60

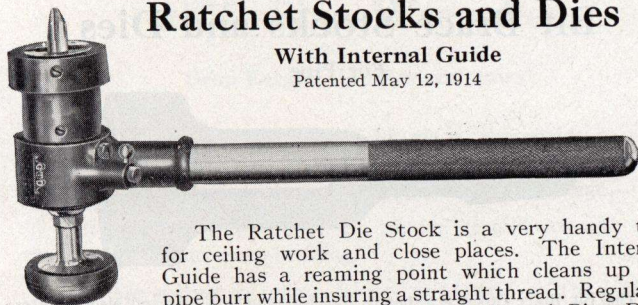
Extra lead screws for No. 2 Stocks, \$2.00, for No. 3 Stocks, \$7.00.

Complete assortments using these parts are listed on page 296.

Ratchet Stocks and Dies

With Internal Guide

Patented May 12, 1914



The Ratchet Die Stock is a very handy tool for ceiling work and close places. The Internal Guide has a reaming point which cleans up the pipe burr while insuring a straight thread. Regularly furnished with one reversible Ratchet Stock, Round Pipe Dies, $1\frac{9}{16}$ " diameter, and Internal Guides for each pipe size, in a substantial plain box.

Briggs standard right hand dies furnished unless otherwise specified.

British (Whitworth) standard right hand dies at regular prices.

No.	Price Each	Cutting Sizes	Weight Lbs.	Length Stock Inches	Standard Package
R202A	\$15.75	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	4	14	12
R202B	12.75	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ "	4	14	12
R202C	10.75	$\frac{3}{8}$, $\frac{1}{2}$ "	4	14	12

Round Adjustable Dies for these assortments are listed on page 147.

Repairs for Ratchet Die Stocks

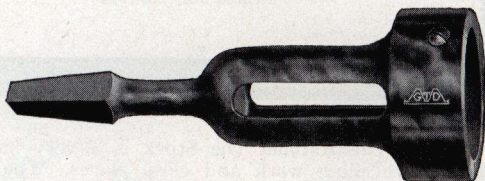
R 202

When ordering repairs mention the stock by number.

Parts	Price	Parts	Price
Head, complete with Pawl Spring, Handle and Screw	\$2.00	Dog and Spring only	\$.50
Stock and Screws	3.50	Quill and Knob	.60
Internal Guides, each	1.00	Handles, each	.30

Bit Brace Stocks and Dies

For Pipe



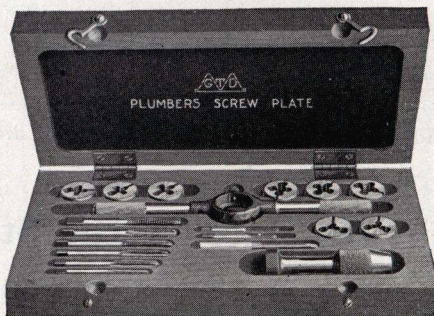
The Bit Brace Stock is a handy tool for plumbers, gas and electric fitters when threading or re-threading gas pipe and conduit outlets in side walls, ceilings and outlet holes in other awkward places.

Regularly furnished with one Bit Brace Stock and round dies $1\frac{9}{16}$ " diameter for each pipe size in plain box.

No.	Price	Cutting Sizes	Weight	Standard Package
207A	\$7.50	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ "	1 lb. 12 oz.	6
207B	5.75	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ "	1 lb. 8 oz.	6

Extra Holders No. 1863, and Extra Dies listed on page 147.

Plumbers' Screw Plates



These sets are very handy for threading flush ball stems, ball cock screws, ball cock rods and after fill tubes.

Regularly furnished with one Stock, one adjustable Tap Wrench, one Screw Driver and one Right Hand Tap and one $1\frac{3}{16}$ " diameter Die for each size.

No.	Price	Cutting Sizes	Weight	Length Stock In.
P6	\$ 9.00	6^{32} , 7^{32} , 8^{32} , 10^{32} , 10^{24} , $\frac{1}{4}^{20}$	$1\frac{3}{4}$ lbs.	$6\frac{1}{4}$
P8	11.00	6^{32} , 7^{32} , 8^{32} , 9^{32} , 10^{32} , 10^{24} , 12^{24} , $\frac{1}{4}^{20}$	$1\frac{3}{4}$ lbs.	$6\frac{1}{4}$

Repair parts for above screw plates listed on pages as follows: Stocks 139; Tap Wrenches 113; Taps 82 and 85; Dies 142 and 143.

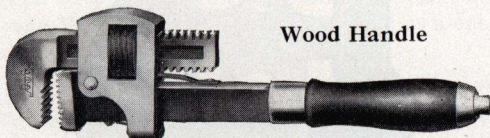
GTD Pipe Wrenches

Drop Forged Handles and Jaws

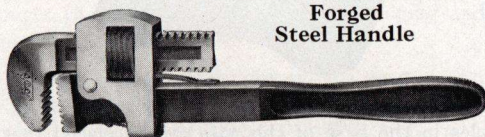
GTD Pipe Wrenches are carefully made, thoroughly inspected and guaranteed. They are given a special heat treatment which toughens the metal and reduces the chances of breakage.

We have improved the design, aiming to add strength where the greatest strains come in using.

Jaws are shaped to take a strong, quick grip on the pipe, yet they release instantly.



Wood Handle



Forged
Steel Handle

GTD Pipe Wrenches

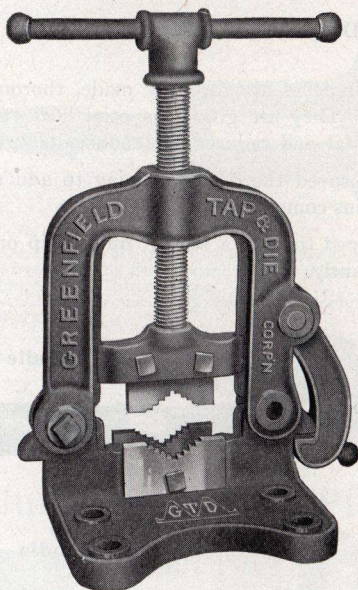
Size	Price Each	Takes Pipe to	Weight Each	No. to Package
6"	\$2.00	1/2"	5 oz.	6
8"	2.25	3/4"	10 oz.	6
10"	2.50	1"	1 1/2 lbs.	6
14"	3.50	1 1/2"	3 lbs.	6
18"	5.00	2"	4 1/2 lbs.	6
24"	7.25	2 1/2"	8 1/2 lbs.	6
36"	13.50	3 1/2"	14 1/2 lbs.	bulk
48"	20.00	5"	25 lbs.	bulk

Wood handles furnished 6" to 14" sizes only. Steel handles furnished for any size.

Repair parts listed on page 308.



GTD Hinged Pipe Vises



These Pipe Vises are made of malleable iron.

The holes in the base of this vise are so placed that there is ample room to allow the use of an ordinary pipe wrench when bolting down to bench or post.

The base is sufficiently strong to permit the omission of the front apron. These Vises can be fastened back from the edge.

Two lugs are cast on the base so that the frame and hook can be reversed.

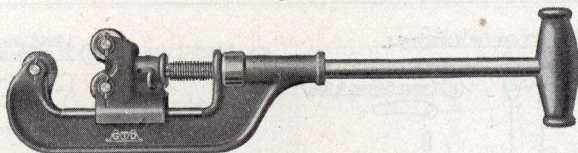
The Jaws furnished with these Vises are made of excellent tool steel. They are carefully hardened and tempered.

No.	Price	Capacity in Inches	Weight Pounds	Vises in a Case
0	\$3.60	$\frac{1}{8}$ to 2	5	12
1	5.00	$\frac{1}{8}$ to $2\frac{1}{2}$	$10\frac{1}{2}$	6
2	7.50	$\frac{1}{8}$ to $3\frac{1}{2}$	16	4
3	11.00	$\frac{1}{8}$ to $4\frac{1}{2}$	24	2

Repair parts listed on page 309

GTD Combination Pipe Cutter

Patented Jan. 4, 1916



A "One" and "Three" Wheel Pipe Cutter

The GTD Combination Pipe Cutter is two tools in one. It is furnished with three wheels and two rollers. The rollers and wheels are interchangeable so that the tool may be used as a one or three wheel pipe cutter.

When shipped, it is assembled as a roller cutter and the two extra wheels are sent with it. It is less than two minutes' work to change it to a three-wheel cutter.

The frame is drop-forged of steel and is both light and strong, much stronger than a malleable casting. Springing and twisting of the frame is almost impossible.

There are no screw-threads cut in the frame. This avoids stripping. The thread on the handle is engaged in a hardened steel nut which outlasts the cutter.

The handle has an extra long bearing in the frame supporting it, guaranteeing a much longer life.

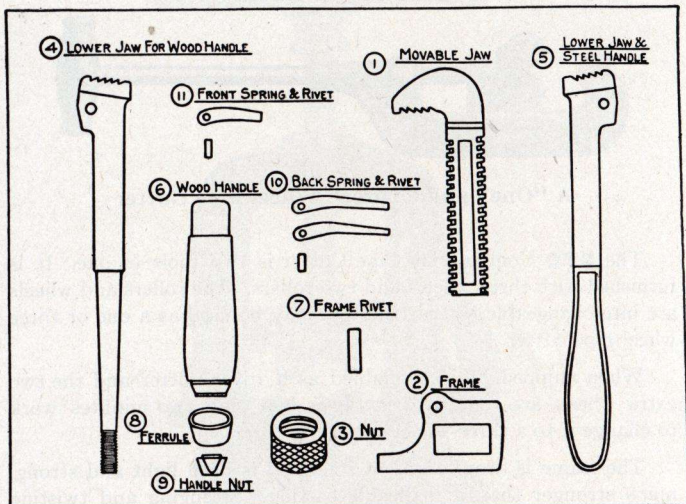
The slide is continuous—there being no break in it. This affords the yoke a full support at all times and does away with sticking and catching while cutting.

Size	Price	Range	Weight
1	\$4.50	$\frac{1}{8}$ to $1\frac{1}{4}$	4 lbs.
2	6.00	$\frac{1}{8}$ to 2	5 lbs.
3	10.00	$\frac{1}{2}$ to 3	7 lbs.

Each Pipe Cutter is packed in a separate box. Distributors are requested to order lots of six or multiples of this number.

Repair parts listed on page 310

Parts for GTD Pipe Wrenches

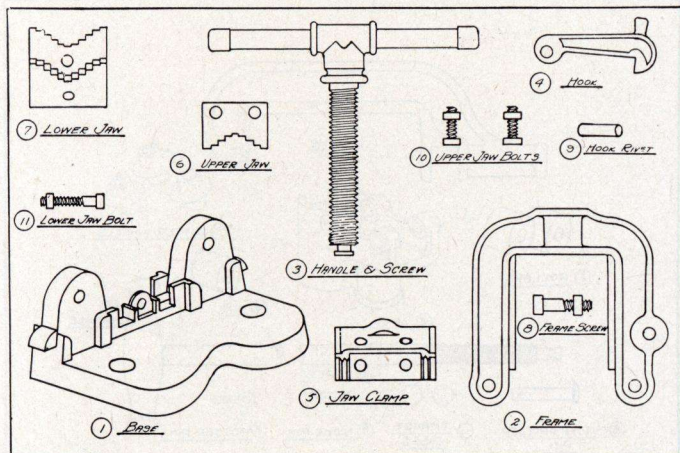


To avoid mistakes please order by number.

Size	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
6"	\$.75	\$.38	\$.12	\$.95	\$.95	\$.16
8"	.80	.42	.15	1.00	1.00	.20
10"	.85	.50	.20	1.10	1.10	.20
14"	1.15	.60	.30	1.50	1.50	.20
18"	1.75	.75	.35	....	2.25	...
24"	2.25	.95	.55	....	3.50	...
36"	4.35	1.70	1.10	....	7.00	...
48"	7.50	2.20	1.50	....	10.50	...

Size	No. 7	No. 8	No. 9	No. 10	No. 11
6"	.05	.10	.15	.20	.10
8"	.05	.10	.15	.20	.10
10"	.05	.12	.20	.20	.10
14"	.05	.15	.20	.20	.10
18"	.05	...	...	.20	.10
24"	.05	...	...	.20	.10
36"	.05	...	...	.30	.15
48"	.05	...	...	.30	.15

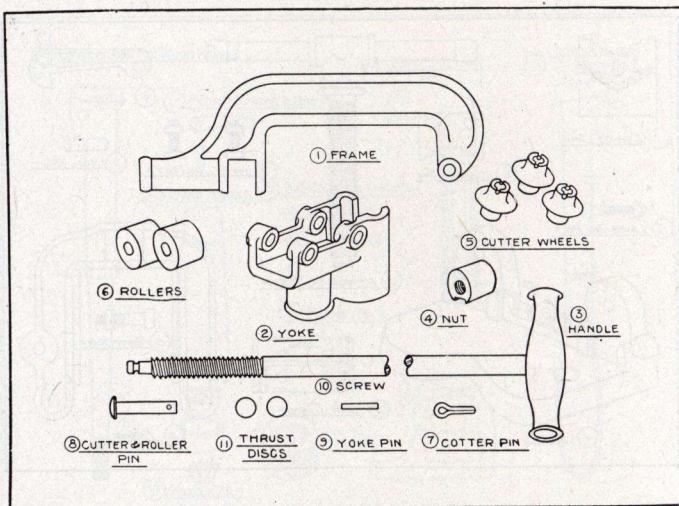
Parts for GTD Hinged Pipe Vises



To avoid mistakes please order by number.

No. of Part	Name of Part	List Price			
		No. 0	No. 1	No. 2	No. 3
1	Base	\$1.40	\$1.90	\$2.80	\$4.20
2	Frame	.90	1.20	1.80	2.65
3	Hook	.25	.35	.50	.75
4	Jaw Clamps	.25	.30	.45	.65
5	Handle and Screw	1.00	1.40	2.20	3.00
6	Upper Jaw (1)	.50	.65	.90	1.30
7	Lower Jaws (2)	.90	1.10	1.60	2.20
8	Frame Screw	.10	.10	.15	.15
9	Hook Rivet	.05	.05	.05	.10
10	Upper Jaw Bolts (2)	.20	.20	.30	.30
11	Lower Jaw Bolt	.10	.10	.15	.15

Parts for GTD Pipe Cutters



To avoid mistakes please order by number.

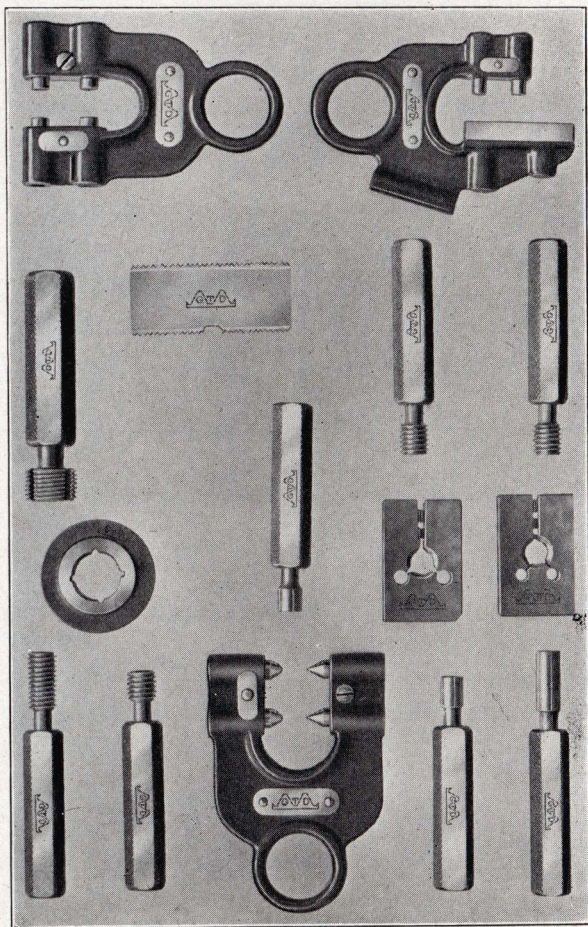
No. of Part	Name of Part	List Price		
		No. 1	No. 2	No. 3
1	Frame	\$2.00	\$2.50	\$4.00
2	Yoke	1.25	1.25	2.50
3	Handle	.50	.50	.50
4	Nut	.35	.35	.40
5	Cutter Wheels, each	.40	.40	.50
6	Rollers, each	.30	.30	.40
7	Cotter Pins, each	.10	.10	.15
8	Cutter & Roller Pins, each	.15	.15	.20
9	Yoke Pin	.10	.10	.10
10	Screw	.50	.75	1.50
11	Thrust Discs, per pair	.10	.10	.15
3-10	Handle with Screw	1.00	1.25	2.00

A Few Types of STD

Standard Cases



A Few Types of GTD Standard Gages



Interchangeable Manufacture

One of the essential characteristics of really modern mechanical equipment, whether it be machinery or mechanical appliances, is interchangeability.

Interchangeability of parts or units is that condition which will permit of the replacement by a new one, of a worn or broken part without special "fitting" such as scraping, filing or even additional machining.

Manufacturing methods which will result in an interchangeable product are followed by progressive concerns because of the resulting satisfaction to their customers, the enhanced value of their stock of parts, the reduced manufacturing expense and because of the fact that truly interchangeable parts are in themselves a good advertisement.

The greater the production requirement the greater is the need for methods leading to interchangeability and standardization of design and of operations.

Interchangeable manufacturing can only be accomplished by safeguarding the various operations with the proper gages. If these gages are made by a reputable manufacturer to proper standards of accuracy, many difficulties which would otherwise be troublesome will be avoided and such a standardized product will interchange readily with another manufacturer's similarly standardized part when required.

The Greenfield Tap and Die Corporation is well equipped to supply the various types of gages required by the manufacturing industries and a large stock of standard gages is maintained for quick delivery.

An illustration of our types of stock gages is shown on opposite page and a full description of these, together with considerable and reliable gage data will be found in our Gage Catalog, a copy of which will gladly be sent on request.

The co-operation of our engineers in the solution of the threading and gaging problems of our customers is unreservedly offered.

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Screw Threading Terms and Their Definitions

Allowance. A difference in dimensions, the limits of which are prescribed. It is to provide for different kinds or classes of fit. It represents maximum tightness or minimum looseness.

Angle of Thread. The angle included between the sides of the thread, measured in an axial plane.

Axis of Screw. The longitudinal central line through the screw.

Base of Thread. The bottom section of a thread; the greatest section between the two adjacent roots.

Basic Size. The exact theoretical value from which all variations are made.

Chamfer. The taper toward point of tap (or in throat of die) made by cutting away the tops of the first few threads to permit free entry into (or onto) the work to be threaded and to distribute the work of cutting among several teeth. Sometimes called "Plug-ging" and occasionally miscalled "Lead."

Crest. The top surface joining the two sides of a thread.

Crest Clearance. Defined on a screw form as the space between the crest of a thread and the root of its mating thread.

Depth of Engagement. The depth of thread in contact, of two mating parts—measured radially.

Depth of Thread. The distance between the top and the base of thread measured normal to the axis.

Effective Size. The size resulting from a combination of pitch diameter and lead error in the length of engagement. With a given lead error the "effective" size of an external thread will be larger than the pitch diameter, and smaller on an internal thread. On a 60° thread the "effective size" will be .00173" larger than pitch diameter for each .001" lead error in a given length.

Engagement—Length of. The length of overlap between a male and female thread in assembly. Often expressed in terms of nominal diameter of the thread, "as 1½ diameters length of engagement," in which case a screw would be inserted for a distance equal to 1½ times its nominal diameter.

Finish. The character of the surface on a screw thread.

Fit. The relation between two mating parts with reference to ease of assembly, as for example: loose fit, medium fit, close fit, wrench fit, etc. The quality of fit is dependent upon both the relative size and the quality of finish of the mating parts.

Gage Increment. Gage increment is a predetermined amount by which the net tolerance of the product is increased for gaging purposes.

Screw Threading Terms and Their Definitions

(Continued)

Helix Angle. The angle made by the helix of the thread at the pitch diameter with a plane perpendicular to the axis.

Lead. The distance a screw thread advances axially in one turn. On a single thread screw the lead and pitch are identical. On a double thread screw the lead is twice the pitch; on a triple thread screw the lead is three times the pitch, etc.

Limits. The extreme dimensions, which are prescribed to provide for variations in fit and workmanship.

Major Diameter. Commonly known as outside diameter. The largest diameter of the thread on the screw or nut. The term "major diameter" replaces the term "outside diameter" as applied to the thread of a screw and also the term "full diameter" as applied to the thread of a nut.

Minor Diameter. Commonly known as core or root diameter. The smallest diameter of the thread on the screw or nut. The term "minor diameter" replaces the term "core diameter" and "root diameter" as applied to the thread of a screw and also the term "inside diameter" as applied to the thread of a nut.

Neutral Zone. A space between the mating parts which is not to be encroached upon.

Number of Threads. The number of threads in any unit of length.

Pitch. The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the axis. The pitch equals 1 divided by the number of threads per inch.

Pitch Diameter. On a straight screw thread the pitch diameter is the diameter of an imaginary cylinder which would pass through the threads at such points as to make the width of the threads and the width of the spaces cut by the surface of the cylinder, equal.

Root. The bottom surface joining the sides of two adjacent threads.

Screw Helix. The path of a point moving at a uniform angular rate on a cylindrical or conical surface and at the same time moving at a uniform axial rate.

Screw Thread. A ridge of some desired profile generated in the form of a helix on the inside or outside of a cylinder or cone.

Screw Threading Terms and Their Definitions

(Continued)

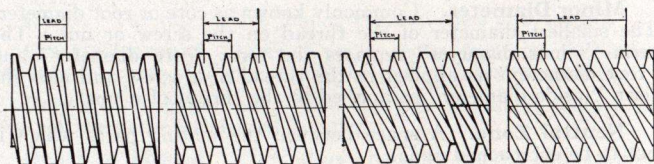
Side (of Thread). The surface of the thread which connects the crest with the root.

Standard Hole. A tapped hole made to standard size. (Used particularly by those who consider the hole, rather than the maximum internal member, as basic size.)

Tolerance. A definite difference in the dimensions prescribed in order to permit of variations in manufacture. It is equal to the difference between the maximum and minimum sizes.

Thread, Single. A thread in which the lead is equal to the pitch.

Thread, Double. A thread in which the lead is equal to two times the pitch.



Thread, Triple. A thread in which the lead is equal to three times the pitch.

Thread, Quadruple. A thread in which the lead is equal to four times the pitch.

Note. In ordering tools with multiple threads be sure to specify both pitch and lead, as **12P, 6 lead**.

Thread, Buttress, one with one side at right angles and the other side at 45° to the screw axis. The right angular side is always used as the thrust side. This thread has a symmetrical form and a depth of .75.

Thread, Drunken. A thread in which the advance of the helix is irregular.

Thread, Ratchet. Same form as Buttress Thread but understood to be somewhat sharper at crest and root.

Thread, V. A form of thread having 60° angle and sharp top and bottom. Impossible in practice and always more or less modified to suit individual conditions.

Glossary of Terms

Pertaining to Drills, their Manufacture and Use

1. **Axis**—An imaginary line drawn through the exact center of the drill from end to end.
2. **Blade**—The solid section of the drill either side of the flute.
3. **Clearance**—That part cut away from the land immediately back of the margin.
4. **Flute**—That portion cut away between the blades.
5. **Lip**—That section of the drill which forms the cutting edge.
6. **Lip Clearance**—That part ground away immediately back of the cutting edge.
7. **Margin**—The narrow ridge or section which runs along the forward part of the blade for its entire length. This is the part of the drill which makes its size and diameter.
8. **Neck**—That recess portion just back of the flute extending up to shank to facilitate marking.
9. **Oil Hole Drill**—A drill which has a hole or channel through the entire length of flute through which the oil flows to the point.
10. **Oil Tube Drill**—A drill which has an inserted tube the entire length of the flute through which the oil flows to the point.
11. **Periphery**—An imaginary line bounding the greatest outside diameter of the fluted section, or the greatest outside diameter at the cutting edge.
12. **Shank**—That section of the drill by which it is held.
13. **Tang**—The blade at the end of the Taper Shank which acts as a positive drive.
14. **Web**—That section of the drill which lies at the bottom of the flute connecting the two blades.



Specifications of Hand Taps

Diam. of Tap Inches	Length, Inches		Diam. of Shank Inches	Size of Square Inches
	Thread	Overall		
$\frac{1}{4}$	1	$2\frac{1}{2}$	.2530	.1897
$\frac{17}{64}$	1	$2\frac{1}{2}$	.2686	.2015
$\frac{9}{32}$	1	$2\frac{1}{2}$	.2843	.2132
$\frac{19}{64}$	1	$2\frac{1}{2}$	.2999	.2249
$\frac{5}{16}$	$1\frac{1}{8}$	$2\frac{23}{32}$	.3155	.2366
$\frac{21}{64}$	$1\frac{1}{8}$	$2\frac{23}{32}$	.3311	.2483
$\frac{11}{32}$	$1\frac{1}{8}$	$2\frac{23}{32}$	.3468	.2601
$\frac{23}{64}$	$1\frac{1}{8}$	$2\frac{23}{32}$	.3624	.2718
$\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.3785	.2839
$\frac{25}{64}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.3941	.2956
$\frac{13}{32}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.4098	.3074
$\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.2750	.2062
$\frac{25}{64}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.2906	.2179
$\frac{13}{32}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.3062	.2296
$\frac{27}{64}$	$1\frac{1}{4}$	$2\frac{15}{16}$	.3218	.2414
$\frac{7}{16}$	$1\frac{7}{16}$	$3\frac{5}{32}$	.3232	.2424
$\frac{29}{64}$	$1\frac{7}{16}$	$3\frac{5}{32}$	.3388	.2541
$\frac{15}{32}$	$1\frac{7}{16}$	$3\frac{5}{32}$	.3544	.2658
$\frac{31}{64}$	$1\frac{7}{16}$	$3\frac{5}{32}$	.3700	.2775
$\frac{1}{2}$	$1\frac{21}{32}$	$3\frac{3}{8}$	.3667	.2750
$\frac{33}{64}$	$1\frac{21}{32}$	$3\frac{3}{8}$	.3823	.2867
$\frac{17}{32}$	$1\frac{21}{32}$	$3\frac{3}{8}$	.3979	.2984
$\frac{35}{64}$	$1\frac{21}{32}$	$3\frac{3}{8}$	.4135	.3101
$\frac{9}{16}$	$1\frac{21}{32}$	$3\frac{19}{32}$	.4292	.3219
$\frac{37}{64}$	$1\frac{21}{32}$	$3\frac{19}{32}$	.4448	.3336
$\frac{19}{32}$	$1\frac{21}{32}$	$3\frac{19}{32}$	.4604	.3453
$\frac{39}{64}$	$1\frac{21}{32}$	$3\frac{19}{32}$	.4760	.3570
$\frac{5}{8}$	$1\frac{13}{16}$	$3\frac{13}{16}$	.4796	.3597
$\frac{41}{64}$	$1\frac{13}{16}$	$3\frac{13}{16}$	.4952	.3714
$\frac{21}{32}$	$1\frac{13}{16}$	$3\frac{13}{16}$	.5108	.3831
$\frac{11}{16}$	$1\frac{13}{16}$	$4\frac{1}{32}$	.5421	.4066
$\frac{23}{32}$	$1\frac{13}{16}$	$4\frac{1}{32}$	.5733	.4300
$\frac{3}{4}$	2	$4\frac{1}{4}$	.5900	.4425
$\frac{25}{32}$	2	$4\frac{1}{4}$	.6212	.4659
$\frac{13}{16}$	2	$4\frac{15}{32}$	.6525	.4894
$\frac{27}{32}$	2	$4\frac{15}{32}$	.6837	.5128
$\frac{7}{8}$	$2\frac{7}{32}$	$4\frac{11}{16}$	.6973	.5230
$\frac{29}{32}$	$2\frac{7}{32}$	$4\frac{11}{16}$	.7285	.5464
$\frac{15}{16}$	$2\frac{7}{32}$	$4\frac{29}{32}$	.7598	.5698
$\frac{31}{32}$	$2\frac{7}{32}$	$4\frac{29}{32}$	.7910	.5932
1	$2\frac{1}{2}$	$5\frac{1}{8}$	.8000	.6000
$1\frac{1}{32}$	$2\frac{1}{2}$	$5\frac{1}{8}$	.8312	.6234
$1\frac{1}{16}$	$2\frac{1}{2}$	$5\frac{1}{8}$	.8625	.6469
$1\frac{1}{8}$	$2\frac{9}{16}$	$5\frac{7}{16}$	.8965	.6724
$1\frac{5}{32}$	$2\frac{9}{16}$	$5\frac{7}{16}$	.9277	.6958
$1\frac{3}{16}$	$2\frac{9}{16}$	$5\frac{7}{16}$	.9590	.7192

For tolerances, see page 322.



Specifications of Hand Taps

Diameter of Tap, Inches	Length, Inches		Diameter of Shank, Inches	Size of Square, Inches
	Thread	Overall		
1 1/4	2 9/16	5 3/4	1.0215	.7661
1 9/32	2 9/16	5 3/4	1.0527	.7895
1 5/16	2 9/16	5 3/4	1.0840	.8130
1 3/8	3	6 1/16	1.1083	.8312
1 13/32	3	6 1/16	1.1395	.8546
1 7/16	3	6 1/16	1.1708	.8781
1 1/2	3	6 3/8	1.2333	.9250
1 17/32	3	6 3/8	1.2645	.9484
1 5/8	3 3/16	6 11/16	1.3050	.9787
1 21/32	3 3/16	6 11/16	1.3362	1.0021
1 3/4	3 3/16	7	1.4300	1.0725
1 25/32	3 3/16	7	1.4612	1.0959
1 7/8	3 9/16	7 5/16	1.5195	1.1396
1 29/32	3 9/16	7 5/16	1.5507	1.1630
2	3 9/16	7 5/8	1.6445	1.2334
2 1/32	3 9/16	7 5/8	1.6757	1.2568
2 1/8	3 9/16	8	1.7694	1.3271
2 5/32	3 9/16	8	1.8007	1.3505
2 1/4	3 9/16	8 1/4	1.8944	1.4208
2 9/32	3 9/16	8 1/4	1.9257	1.4443
2 3/8	4	8 1/2	2.0194	1.5146
2 13/32	4	8 1/2	2.0507	1.5380
2 1/2	4	8 3/4	2.1000	1.5750
2 17/32	4	8 3/4	2.1313	1.5984
2 5/8	4	8 3/4	2.2250	1.6687
2 21/32	4	8 3/4	2.2563	1.6922
2 3/4	4	9 1/4	2.3500	1.7625
2 25/32	4	9 1/4	2.3813	1.7859
2 7/8	4	9 1/4	2.4750	1.8562
2 29/32	4	9 1/4	2.5063	1.8797
3	4 9/16	9 3/4	2.5429	1.9072
3 1/32	4 9/16	9 3/4	2.5742	1.9306
3 1/8	4 9/16	9 3/4	2.6679	2.0009
3 5/32	4 9/16	9 3/4	2.6992	2.0244
3 1/4	4 9/16	10	2.7929	2.0946
3 9/32	4 9/16	10	2.8242	2.1181
3 3/8	4 9/16	10	2.8827	2.1620
3 13/32	4 9/16	10	2.9140	2.1855
3 1/2	4 15/16	10 1/4	3.0077	2.2557
3 17/32	4 15/16	10 1/4	3.0390	2.2792
3 5/8	4 15/16	10 1/4	3.1327	2.3495
3 21/32	4 15/16	10 1/4	3.1640	2.3730
3 3/4	5 5/16	10 1/2	3.2167	2.4125
3 25/32	5 5/16	10 1/2	3.2479	2.4359
3 7/8	5 5/16	10 1/2	3.3417	2.5062
3 29/32	5 5/16	10 1/2	3.3729	2.5297
4	5 5/16	10 3/4	3.4667	2.6000

For tolerances, see page 322.



Tolerances for Hand Taps

Length overall, $\frac{1}{4}$ " to $1\frac{1}{32}$ " incl.	plus or minus $\frac{1}{32}$ "
Length overall, $1\frac{1}{16}$ " to 4" incl.	plus or minus $\frac{1}{16}$ "
Length of thread	plus or minus $\frac{3}{64}$ "
Diam. of shank to 1" incl.	size to size minus .005"
Diam. of shank $1\frac{1}{32}$ " to 2" incl.	size to size minus .007"
Diam. of shank over 2"	size to size minus .009"
Size of square, $\frac{1}{2}$ " and smaller	size to size minus .004"
Size of square, $\frac{3}{64}$ " to 1" incl.	size to size minus .006"
Size of square, $1\frac{1}{32}$ " to 2" incl.	size to size minus .008"
Size of square, $2\frac{1}{32}$ " to 4" incl.	size to size minus .010"

Tolerances for Pipe Taps

Length overall, $\frac{1}{8}$ " to $\frac{3}{4}$ " incl.	plus or minus $\frac{1}{32}$ "
Length overall, $\frac{7}{8}$ " to 4" incl.	plus or minus $\frac{1}{16}$ "
Length of thread	plus or minus $\frac{3}{64}$ "
Diameter of shank to $\frac{1}{2}$ " incl.	size to size minus .007"
Diam. of shank over $\frac{1}{2}$ "	size to size minus .009"
Size of square to $\frac{1}{2}$ " incl.	size to size minus .006"
Size of square over $\frac{1}{2}$ "	size to size minus .010"
Distance projecting through gage, $\frac{1}{8}$ " to $\frac{3}{4}$ " incl.	plus or minus $\frac{1}{16}$ "
Distance projecting through gage, 1" to 3" incl.	plus or minus $\frac{3}{32}$ "
Distance projecting through gage, $3\frac{1}{2}$ " and over	plus or minus $\frac{1}{8}$ "

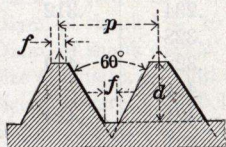
Specifications of Pipe Taps

Nominal Sizes Inches	Length, Inches		Diam. of Shank Inches	Size of Square Inches	Dist. Small End of Briggs Std. Tap Projects Through Gage
	Thread	Overall			
$\frac{1}{8}$	$\frac{3}{4}$	$2\frac{1}{8}$	.3125 .4375	.234 .328	.312
$\frac{1}{4}$	$1\frac{1}{16}$	$2\frac{7}{16}$	.4375 .5625	.328 .421	.459
$\frac{3}{8}$	$1\frac{1}{16}$	$2\frac{9}{16}$	.5625 .7000	.421 .531	.454
$\frac{1}{2}$	$1\frac{3}{8}$	$3\frac{1}{8}$	.6875 .8650	.515 .640	.579
$\frac{5}{8}$	$1\frac{3}{8}$	$3\frac{3}{16}$	.8125 .9270	.594 .687	
$\frac{3}{4}$	$1\frac{3}{8}$	$3\frac{1}{4}$	.9063 1.0750	.679 .812	.565
$\frac{7}{8}$	$1\frac{9}{16}$	$3\frac{1}{2}$	1.0937	.812	
1	$1\frac{3}{4}$	$3\frac{3}{4}$	1.1250	.843	.678
$1\frac{1}{4}$	$1\frac{3}{4}$	4	1.3125	.984	.686
$1\frac{1}{2}$	$1\frac{3}{4}$	$4\frac{1}{4}$	1.5000	1.125	.699
$1\frac{3}{4}$	$1\frac{3}{4}$	$4\frac{3}{8}$	1.6250	1.218	
2	$1\frac{3}{4}$	$4\frac{1}{2}$	1.8750	1.406	.667
$2\frac{1}{4}$	$2\frac{1}{8}$	5	2.0000	1.500	
$2\frac{1}{2}$	$2\frac{9}{16}$	$5\frac{1}{2}$	2.2500	1.687	.925
$2\frac{3}{4}$	$2\frac{9}{16}$	$5\frac{3}{4}$	2.3750	1.781	
3	$2\frac{5}{8}$	6	2.6250	1.968	.925
$3\frac{1}{4}$	$2\frac{5}{8}$	$6\frac{1}{4}$	2.7500	2.062	
$3\frac{1}{2}$	$2\frac{11}{16}$	$6\frac{1}{2}$	2.8125	2.108	.938
$3\frac{3}{4}$	$2\frac{11}{16}$	$6\frac{5}{8}$	2.8750	2.156	
4	$2\frac{3}{4}$	$6\frac{3}{4}$	3.0000	2.250	.950

For tolerances, see opposite page.

Basic Thread Dimensions and Tap Drill Sizes

United States Standard Thread



FORMULAE

$$p = \text{pitch} = \frac{1}{\text{No. of threads per inch}}$$

$$d = \text{depth} = \text{pitch} \times .649519 \text{ or } \frac{.649519}{n}$$

$$f = \text{flat} = \frac{\text{pitch}}{8}$$

$$n = \text{threads per inch}$$

Note:—This thread is used in SAE, USF, and ASME Screws, the ASME system being recommended by the American Society of Mechanical Engineers, May, 1907. Complete dimensions and limits for screws and taps are given on pages 325, 326.

TAP DRILL SIZES

A full depth of thread in a common nut is only 5% stronger than a 75% depth of thread; yet it requires three times the power to tap.

A common nut, drilled out so that it contains only 50% of a full depth thread will break the bolt before it will strip — in nine cases out of ten.

Therefore a 75% depth of thread yields an ample margin of safety (2 to 1) and is much more economical in tapping.

The drill size indicated is the nearest commercial size to produce the result.

The following formula is given in case a tap drill size is required for a diameter or pitch not shown in the table:

$$\text{DIAMETER OF TAP, MINUS } \frac{.974}{\text{NO. THREADS PER INCH}} = \text{DIAMETER OF HOLE}$$

Basic Thread Dimensions and Tap Drill Sizes

ASME THREADS

Nominal Size	Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	Commercial Tap Drill To Produce Approximately 75% Full Th'd
0-80	.0600	.0519	.0438	$\frac{3}{64}$
1-56	.0730	.0614	.0498	54
64	.0730	.0629	.0527	53
72	.0730	.0640	.0550	53
2-56	.0860	.0744	.0628	50
64	.0860	.0759	.0657	50
3-48	.0990	.0855	.0719	47
56	.0990	.0874	.0758	45
4-32	.1120	.0917	.0714	45
36	.1120	.0940	.0759	44
40	.1120	.0958	.0795	43
48	.1120	.0985	.0849	42
5-36	.1250	.1078	.0889	40
40	.1250	.1088	.0925	38
44	.1250	.1102	.0955	37
6-32	.1380	.1177	.0974	36
36	.1380	.1200	.1019	34
40	.1380	.1218	.1055	33
7-30	.1510	.1294	.1077	31
32	.1510	.1307	.1104	31
36	.1510	.1330	.1149	$\frac{1}{8}$
8-30	.1640	.1423	.1207	30
32	.1640	.1437	.1234	29
36	.1640	.1460	.1279	29
40	.1640	.1478	.1315	28
9-24	.1770	.1499	.1229	29
30	.1770	.1553	.1337	27
32	.1770	.1567	.1364	26

Concluded on following page



Basic Thread Dimensions and Tap Drill Sizes

ASME THREADS—Concluded

Nominal Size	Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	Commercial Tap Drill To Produce Approximately 75% Full Th'd
10-24	.1900	.1629	.1359	25
28	.1900	.1668	.1436	23
30	.1900	.1684	.1467	22
32	.1900	.1697	.1494	21
12-24	.2160	.1889	.1619	16
28	.2160	.1928	.1696	14
32	.2160	.1957	.1754	13
14-20	.2420	.2095	.1770	10
24	.2420	.2149	.1879	7
16-18	.2680	.2319	.1966	3
20	.2680	.2355	.2030	$\frac{7}{32}$
22	.2680	.2385	.2090	2
18-18	.2940	.2579	.2218	B
20	.2940	.2615	.2290	D
20-16	.3200	.2794	.2388	G
18	.3200	.2839	.2478	$\frac{17}{64}$
20	.3200	.2875	.2550	I
22-16	.3460	.3054	.2648	$\frac{9}{32}$
18	.3460	.3099	.2738	L
24-16	.3720	.3314	.2908	$\frac{5}{16}$
18	.3720	.3359	.2998	O
26-14	.3980	.3516	.3052	$\frac{21}{64}$
16	.3980	.3574	.3168	R
28-14	.4240	.3776	.3312	T
16	.4240	.3834	.3428	$\frac{23}{64}$
30-14	.4500	.4036	.3572	V
16	.4500	.4094	.3688	$\frac{25}{64}$

Basic Thread Dimensions and Tap Drill Sizes

UNITED STATES THREAD

Nominal Size	Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	Commercial Tap Drill To Produce Approximately 75% Full Th'd
$\frac{1}{16}$ -64	.0625	.0524	.0422	$\frac{3}{64}$
72	.0625	.0535	.0445	$\frac{3}{64}$
$\frac{5}{64}$ -60	.0781	.0673	.0563	$\frac{1}{16}$
72	.0781	.0691	.0601	52
$\frac{3}{32}$ -48	.0938	.0803	.0667	49
50	.0938	.0808	.0678	49
$\frac{7}{64}$ -48	.1094	.0959	.0823	43
$\frac{1}{8}$ -32	.1250	.1047	.0844	$\frac{3}{32}$
40	.1250	.1088	.0925	38
$\frac{9}{64}$ -40	.1406	.1244	.1081	32
$\frac{5}{32}$ -32	.1563	.1360	.1157	$\frac{1}{8}$
36	.1563	.1382	.1202	30
$\frac{11}{64}$ -32	.1719	.1505	.1313	$\frac{9}{64}$
$\frac{3}{16}$ -24	.1875	.1604	.1334	26
32	.1875	.1672	.1469	22
$\frac{13}{64}$ -24	.2031	.1760	.1490	20
$\frac{7}{32}$ -24	.2188	.1919	.1646	16
32	.2188	.1985	.1782	12
$\frac{15}{64}$ -24	.2344	.2073	.1806	10
$\frac{1}{4}$ -20	.2500	.2176	.1850	7
24	.2500	.2229	.1959	4
27	.2500	.2260	.2019	3
28	.2500	.2268	.2036	3
32	.2500	.2297	.2094	$\frac{7}{32}$
$\frac{5}{16}$ -18	.3125	.2764	.2403	F
20	.3125	.2800	.2476	$\frac{17}{64}$
24	.3125	.2854	.2584	I
27	.3125	.2884	.2644	J
32	.3125	.2922	.2719	$\frac{9}{32}$

Continued on following page



Basic Thread Dimensions and Tap Drill Sizes

UNITED STATES THREAD—Continued

Nominal Size	Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	Commercial Tap Drill To Produce Approximately 75% Full Th'd
$\frac{3}{8}$ -16	.3750	.3344	.2938	$\frac{5}{16}$
20	.3750	.3425	.3100	$\frac{21}{64}$
24	.3750	.3479	.3209	O
27	.3750	.3509	.3269	R
$\frac{7}{16}$ -14	.4375	.3911	.3447	U
20	.4375	.4050	.3726	$\frac{25}{64}$
24	.4375	.4104	.3834	X
27	.4375	.4134	.3894	Y
$\frac{1}{2}$ -12	.5000	.4459	.3918	$\frac{27}{64}$
13	.5000	.4501	.4001	$\frac{27}{64}$
20	.5000	.4675	.4351	$\frac{29}{64}$
24	.5000	.4729	.4459	$\frac{29}{64}$
27	.5000	.4759	.4519	$\frac{15}{32}$
$\frac{9}{16}$ -12	.5625	.5084	.4542	$\frac{31}{64}$
18	.5625	.5264	.4903	$\frac{33}{64}$
27	.5625	.5384	.5144	$\frac{17}{32}$
$\frac{5}{8}$ -11	.6250	.5660	.5069	$\frac{17}{32}$
12	.6250	.5709	.5168	$\frac{35}{64}$
18	.6250	.5889	.5528	$\frac{37}{64}$
27	.6250	.6009	.5769	$\frac{19}{32}$
$\frac{11}{16}$ -11	.6875	.6285	.5694	$\frac{19}{32}$
16	.6875	.6469	.6063	$\frac{5}{8}$
$\frac{3}{4}$ -10	.7500	.6851	.6201	$\frac{21}{32}$
12	.7500	.6959	.6418	$\frac{43}{64}$
16	.7500	.7094	.6688	$\frac{11}{16}$
27	.7500	.7259	.7019	$\frac{23}{32}$
$\frac{13}{16}$ -10	.8125	.7476	.6826	$\frac{23}{32}$
$\frac{7}{8}$ -9	.8750	.8029	.7307	$\frac{49}{64}$
12	.8750	.8209	.7668	$\frac{51}{64}$
14	.8750	.8286	.7822	$\frac{13}{16}$
18	.8750	.8389	.8028	$\frac{53}{64}$
27	.8750	.8509	.8269	$\frac{27}{32}$

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Basic Thread Dimensions and Tap Drill Sizes

UNITED STATES THREAD—Concluded

Nominal Size	Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	Commercial Tap Drill To Produce Approximately 75% Full Th'd
$1\frac{5}{16}$ - 9	.9375	.8654	.7932	$5\frac{3}{64}$
1 - 8	1.0000	.9188	.8376	$\frac{7}{8}$
12	1.0000	.9459	.8918	$5\frac{9}{64}$
14	1.0000	.9536	.9072	$1\frac{5}{16}$
27	1.0000	.9759	.9519	$3\frac{1}{32}$
$1\frac{1}{8}$ - 7	1.1250	1.0322	.9394	$6\frac{3}{64}$
12	1.1250	1.0709	1.0168	$1\frac{3}{64}$
$1\frac{1}{4}$ - 7	1.2500	1.1572	1.0644	$1\frac{7}{64}$
12	1.2500	1.1959	1.1418	$1\frac{11}{64}$
$1\frac{3}{8}$ - 6	1.3750	1.2668	1.1585	$1\frac{7}{32}$
12	1.3750	1.3209	1.2668	$1\frac{19}{64}$
$1\frac{1}{2}$ - 6	1.5000	1.3918	1.2835	$1\frac{11}{32}$
12	1.5000	1.4459	1.3918	$1\frac{27}{64}$
$1\frac{5}{8}$ - $5\frac{1}{2}$	1.6250	1.5070	1.3888	$1\frac{29}{64}$
$1\frac{3}{4}$ - 5	1.7500	1.6201	1.4902	$1\frac{9}{16}$
$1\frac{7}{8}$ - 5	1.8750	1.7451	1.6152	$1\frac{11}{16}$
2 - $4\frac{1}{2}$	2.0000	1.8557	1.7113	$1\frac{25}{32}$
$2\frac{1}{8}$ - $4\frac{1}{2}$	2.1250	1.9807	1.8363	$1\frac{29}{32}$
$2\frac{1}{4}$ - $4\frac{1}{2}$	2.2500	2.1057	1.9613	$2\frac{1}{32}$
$2\frac{3}{8}$ - 4	2.3750	2.2126	2.0502	$2\frac{1}{8}$
$2\frac{1}{2}$ - 4	2.5000	2.3376	2.1752	$2\frac{1}{4}$
$2\frac{3}{4}$ - 4	2.7500	2.5876	2.4252	$2\frac{1}{2}$
3 - $3\frac{1}{2}$	3.0000	2.8145	2.6288	$2\frac{23}{32}$
$3\frac{1}{4}$ - $3\frac{1}{2}$	3.2500	3.0645	2.8788	$2\frac{31}{32}$
$3\frac{1}{2}$ - $3\frac{1}{4}$	3.5000	3.3002	3.1003	$3\frac{3}{16}$
$3\frac{3}{4}$ - 3	3.7500	3.5335	3.3170	$3\frac{7}{16}$
4- 3	4.0000	3.7835	3.5670	$3\frac{11}{16}$



The Measurement of Screw Threads by Means of Wires

At the present time the most dependable and most universally recognized method of obtaining measurements of male threaded parts is by means of hard steel wires made to a high degree of accuracy and laid into the threads on opposite sides of a screw, and the measurement being taken over the wires. A measurement so obtained bears a definite relation to the imaginary measurement from the theoretical root of the thread on one side of the screw to the other, and the pitch diameter can then be determined by a simple trigonometrical problem.

The most common rules for figuring wire measurements call for the use of the major diameter of the screw in making calculations. We recommend that the pitch diameter (as determined by subtracting the single basic depth of thread from the nominal major diameter), be used instead, for the reason that the actual major diameter is relatively of small importance and it may, because of actually being under or over nominal size, cause confusion in the calculations, and error in the work.

From the pitch diameter next subtract the theoretical single depth of a complete triangle, with a base equal to the pitch, and to the result (which is the theoretical minor diameter) add for a 60° thread 3 times the wire diameter.

Example: Find "M" or measurement over wires for a $1''^8$ USS Male Thread.

Answer:	Nominal Major Diam.	1.0000	1.00000
	less Single Depth of 8 P. USS		.08118
			<hr/>
			.91881 = P.D.
	less Single Depth Sharp Thread		.1082
			<hr/>
			.81061
	+ 3 W or $(3 \times .072168)$		.21650
			<hr/>
			M = 1.02711

It is to be understood that the wire most used is the so-called "best wire" or wire of such a diameter that it will touch the sides of the thread on the pitch line. In order to make a check of the angle of the thread, if desired, it will be necessary also to use a wire large enough to touch the thread sides near the crest as well as the best wire or one smaller, thereby obtaining two readings. When a complete set of wires is at hand it is possible to use the "best wire" for one thread, as the maximum wire for another pitch thread, and also as the minimum wire for some other pitch.

In order to eliminate as much duplication of figuring as possible, we have originated the chart shown on page 332, by means of which the wire measurement for most common threads can be obtained by simply adding one figure to a given pitch diameter, when a given wire is available. The figures marked (*) are the ones to add when the "best wire" reading is wanted.

For the convenience of those who wish to figure their own tables we call attention to the chart on page 333, which gives the "sharp" single or theoretical depth of various 60° thread pitches together with the "best wire" size for a given pitch. These wire sizes and depths are, of course, applicable to any USF, Briggs Std., or other 60° thread.

The following formulae will be found useful in determining wire measurements for threads other than of 60° angle.

Whitworth	"M" = P.D. — .960491 P. + (3.1657 W)
Brit. Assn.	"M" = P.D. — 1.13633 P. + (3.4829 W)
Lowenherz	"M" = P.D. — P. + (3.23594 W)
Acme	"M" = P.D. — 1.93334 P. + (4.9938 W)



Converting USS Pitch Diameters into Micrometer Reading

By Three Wire Thread Measurement

Formula: $3W P \times .866025$, or amount to add to pitch diameter.

Wire Size	1	2	3	3 1/4	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	11 1/2	12	13	14	16	18	Wire Size
1924498	288674	310880	329917																			1924498
1776462			285306	316432																		1776462
1649572			266469	278305	302423																	1649572
1443387				247435	266566	259811																1443387
1154700					216509	240649	21694	227440														1154700
1049727						192449	188951	202073														1049727
1049727							173205	170581	164957	180421												1049727
0924756								157459	144338													0924756
0824756										191200												0824756
0721687											123718	139182										0721687
0641500													108253									0641500
0577350														129903	113720							0577350
0524863															108847	094475						0524863
0502043																085290						0502043
0481125																	073306	078444	083905			0481125
0444115																		072169	077200	082479		0444115
0412393																				079108		0412393
0360841																					066591	0360841
0320471																						0320471

Wire Size	19	20	22	24	26	27	28	30	32	34	36	40	44	48	50	56	64	72	80	Wire Size
0360841	062572																			0360841
0320741	050042	052921																		0320741
0303865	045579	047858	061795																	0303865
0288675		043301	047238	050018																0288675
0262431			042643	045421																0262431
0240553				039305	042945	040092														0240553
0222054					038857	038357	035887													0222054
0213833					035308	034541	033220	035282												0213833
0206194						032075	030929	032991	034795											0206194
0192448								028867	030471	032263										0192448
0189421									027063	028655	030070	029290								0189421
0169804										025470	026885	026460	028428							0169804
0160370											024055	023619	023619							0160370
0144337														025259						0144337
0134337															022943					0134337
0120279																021650				0120279
0115470																	021650			0115470
0103097																		021322		0103097
0090210																			021322	0090210
0080184																				0080184
0072168																				0072168

* Showing "Best Size" or Wire Touching on P. D.

“Best” Wire Sizes and “Sharp” Thread Depths

For Computing Wire Measurements on 608 Screw Threads
United States Standard

Pitch	Wire Diameter	“Sharp” Single Depth	Pitch	Wire Diameter	“Sharp” Single Depth
3	.1924498	.288675	19	.0303865	.045580
3¼	.1776462	.266469	20	.0288675	.043301
3½	.1649572	.247432	22	.0262431	.039364
4	.1443387	.216506	24	.0240553	.036084
4½	.1282998	.192450	26	.0222054	.033308
5	.1154700	.173205	27	.0213833	.032075
5½	.1049727	.157459	28	.0206194	.030929
6	.0962250	.144337	30	.0192448	.028867
7	.0824786	.123717	32	.0180421	.027063
8	.0721687	.108253	34	.0169804	.025471
9	.0641500	.096225	36	.0160370	.024057
10	.0577350	.0866025	40	.0144337	.021650
11	.0524863	.078729	44	.0131214	.019682
11½	.0502043	.075306	48	.0120279	.018042
12	.0481125	.072168	50	.0115470	.017320
13	.0444115	.066617	56	.0103097	.015465
14	.0412393	.061858	64	.0090210	.013531
16	.0360841	.054126	72	.0080184	.012028
18	.0320741	.048112	80	.0072168	.010825

For explanation of wire measurement, refer to page 330.

Note:—For threads sharper than USS it is preferable to use a wire one size larger than the “best” wire.



ASME Standard Machine Screws

SIZE			OUTSIDE DIAMETERS			PITCH DIAMETERS			ROOT DIAMETERS		
No.	Outside Diam.	Thds. Per In.	Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference
0	.060	80	.0572	.060	.0028	.0505	.0519	.0014	.0410	.0438	.0028
1	.073	72	.0700	.073	.0030	.0625	.0640	.0015	.0520	.0550	.0030
2	.086	64	.0828	.086	.0032	.0743	.0759	.0016	.0624	.0657	.0033
3	.099	56	.0955	.099	.0035	.0857	.0874	.0017	.0721	.0758	.0037
4	.112	48	.1082	.112	.0038	.0966	.0985	.0019	.0807	.0849	.0042
5	.125	44	.1210	.125	.0040	.1082	.1102	.0020	.0910	.0955	.0045
6	.138	40	.1338	.138	.0042	.1197	.1218	.0021	.1007	.1055	.0048
7	.151	36	.1466	.151	.0044	.1308	.1330	.0022	.1097	.1149	.0052
8	.164	36	.1596	.164	.0044	.1438	.1460	.0022	.1227	.1279	.0052
9	.177	32	.1723	.177	.0047	.1544	.1567	.0023	.1307	.1364	.0057
10	.190	30	.1852	.190	.0048	.1660	.1684	.0024	.1407	.1467	.0060
12	.216	28	.2111	.216	.0049	.1904	.1928	.0024	.1633	.1696	.0063
14	.242	24	.2368	.242	.0052	.2123	.2149	.0026	.1808	.1879	.0071
16	.268	22	.2626	.268	.0054	.2358	.2385	.0027	.2014	.2090	.0076
18	.294	20	.2884	.294	.0056	.2587	.2615	.0028	.2208	.2290	.0082
20	.320	20	.3144	.320	.0056	.2847	.2875	.0028	.2468	.2550	.0082
22	.346	18	.3402	.346	.0058	.3070	.3099	.0029	.2649	.2738	.0089
24	.372	16	.3660	.372	.0060	.3284	.3314	.0030	.2810	.2908	.0098
26	.398	16	.3920	.398	.0060	.3544	.3574	.0030	.3070	.3168	.0098
28	.424	14	.4178	.424	.0062	.3745	.3776	.0031	.3204	.3312	.0108
30	.450	14	.4438	.450	.0062	.4005	.4036	.0031	.3464	.3572	.0108

Taps for ASME Standard Machine Screws



GREENFIELD TAP AND DIE CORPORATION

SIZE			OUTSIDE DIAMETERS			PITCH DIAMETERS			ROOT DIAMETERS		
No.	Outside Diam.	Thds P. I.	Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference
0	.060	80	.0609	.0632	.0023	.0528	.0538	.0010	.0447	.0466	.0019
1	.073	72	.0740	.0765	.0025	.0650	.0660	.0010	.0560	.0580	.0020
2	.086	64	.0871	.0898	.0027	.0770	.0781	.0011	.0668	.0689	.0021
3	.099	56	.1002	.1033	.0031	.0886	.0897	.0011	.0770	.0793	.0023
4	.112	48	.1133	.1168	.0035	.0998	.1010	.0012	.0862	.0887	.0025
5	.125	44	.1263	.1301	.0038	.1116	.1129	.0013	.0968	.0995	.0027
6	.138	40	.1394	.1435	.0041	.1232	.1246	.0014	.1069	.1097	.0028
7	.151	36	.1525	.1569	.0044	.1345	.1359	.0014	.1164	.1193	.0029
8	.164	36	.1655	.1699	.0044	.1475	.1489	.0014	.1294	.1323	.0029
9	.177	32	.1786	.1835	.0049	.1583	.1598	.0015	.1380	.1411	.0031
10	.190	30	.1916	.1968	.0052	.1700	.1716	.0016	.1483	.1515	.0032
12	.216	28	.2176	.2232	.0056	.1944	.1961	.0017	.1712	.1745	.0033
14	.242	24	.2438	.2500	.0062	.2167	.2184	.0017	.1897	.1932	.0035
16	.268	22	.2698	.2765	.0067	.2403	.2421	.0018	.2108	.2144	.0036
18	.294	20	.2959	.3031	.0072	.2634	.2652	.0018	.2309	.2346	.0037
20	.320	20	.3219	.3291	.0072	.2894	.2912	.0018	.2569	.2606	.0037
22	.346	18	.3479	.3559	.0080	.3118	.3138	.0020	.2757	.2796	.0039
24	.372	16	.3740	.3828	.0088	.3334	.3354	.0020	.2928	.2968	.0040
26	.398	16	.4000	.4088	.0088	.3594	.3614	.0020	.3188	.3228	.0040
28	.424	14	.4261	.4359	.0098	.3797	.3818	.0021	.3333	.3374	.0041
30	.450	14	.4521	.4619	.0098	.4057	.4078	.0021	.3593	.3634	.0041

Note: Our "go" or minimum male thread gages for tapped holes are made to the "basic" or maximum screw P. D. given on page 334. In other respects our regular ASME Std. gages control sizes as given in these tables.



ASME Special Machine Screws

No.	SIZE Outside Diam.	Thds. P. I.	OUTSIDE DIAMETERS			PITCH DIAMETERS			ROOT DIAMETERS		
			Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference
1	.073	64	.0698	.0730	.0032	.0613	.0629	.0016	.0494	.0527	.0033
2	.086	56	.0825	.0860	.0035	.0727	.0744	.0017	.0591	.0628	.0037
3	.099	48	.0952	.0990	.0038	.0836	.0855	.0019	.0677	.0719	.0042
4	.112	40	.1078	.1120	.0042	.0937	.0958	.0021	.0747	.0795	.0048
5	.125	36	.1206	.1250	.0044	.0918	.0940	.0022	.0707	.0759	.0052
6	.138	36	.1336	.1380	.0044	.1048	.1070	.0022	.0837	.0889	.0052
7	.151	32	.1463	.1510	.0047	.1154	.1177	.0023	.0917	.0974	.0057
8	.164	32	.1593	.1640	.0047	.1270	.1294	.0024	.1017	.1077	.0060
9	.177	30	.1722	.1770	.0048	.1414	.1437	.0023	.1177	.1234	.0057
10	.190	24	.1853	.1900	.0047	.1529	.1553	.0024	.1277	.1377	.0060
12	.216	24	.2108	.2160	.0052	.1674	.1697	.0023	.1437	.1494	.0057
14	.242	20	.2364	.2420	.0056	.1863	.1889	.0026	.1588	.1659	.0071
16	.268	20	.2624	.2680	.0056	.2067	.2095	.0028	.1770	.1889	.0082
18	.294	18	.2882	.2940	.0058	.2327	.2355	.0028	.1948	.2030	.0082
20	.320	18	.3142	.3200	.0058	.2510	.2579	.0039	.2129	.2218	.0089
22	.346	16	.3400	.3460	.0060	.2810	.2839	.0029	.2389	.2478	.0089
24	.372	18	.3662	.3720	.0058	.3024	.3054	.0030	.2550	.2648	.0098
26	.398	14	.3918	.3980	.0062	.3330	.3359	.0029	.2909	.2998	.0089
28	.424	16	.4180	.4240	.0060	.3485	.3516	.0031	.2944	.3052	.0108
30	.450	16	.4440	.4500	.0060	.3804	.3834	.0030	.3330	.3428	.0098
						.4064	.4094	.0030	.3590	.3688	.0098

Taps for ASME Special Machine Screws



GREENFIELD TAP AND DIE CORPORATION

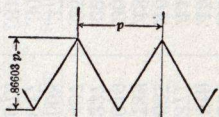
SIZE			OUTSIDE DIAMETERS				PITCH DIAMETERS				ROOT DIAMETERS			
No.	Outside Diam.	Thds. P. I.	Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference
1	.073	64	.0741	.0768	.0027	.0640	.0651	.0011	.0538	.0559	.0021	.0538	.0559	.0021
2	.086	56	.0872	.0903	.0031	.0756	.0767	.0011	.0640	.0663	.0023	.0640	.0663	.0023
3	.099	48	.1003	.1038	.0035	.0868	.0880	.0012	.0732	.0757	.0025	.0732	.0757	.0025
4	.112	40	.1134	.1175	.0041	.0972	.0986	.0014	.0809	.0837	.0028	.0809	.0837	.0028
5	.125	36	.1135	.1179	.0044	.0955	.0969	.0014	.0774	.0803	.0029	.0774	.0803	.0029
6	.138	36	.1264	.1305	.0041	.1102	.1116	.0014	.0939	.0967	.0028	.0939	.0967	.0028
7	.151	32	.1395	.1439	.0044	.1085	.1099	.0014	.0904	.0933	.0029	.0904	.0933	.0029
8	.164	32	.1526	.1575	.0049	.1215	.1229	.0014	.1034	.1063	.0029	.1034	.1063	.0029
9	.177	30	.1396	.1445	.0049	.1193	.1208	.0015	.0990	.1021	.0031	.0990	.1021	.0031
10	.190	30	.1526	.1578	.0052	.1323	.1338	.0015	.1120	.1151	.0031	.1120	.1151	.0031
12	.216	24	.1656	.1705	.0049	.1453	.1468	.0015	.1250	.1281	.0031	.1250	.1281	.0031
14	.242	20	.1786	.1838	.0052	.1440	.1456	.0016	.1223	.1255	.0032	.1223	.1255	.0032
16	.268	20	.1850	.1900	.0062	.1517	.1534	.0017	.1353	.1385	.0032	.1353	.1385	.0032
18	.294	18	.1916	.1965	.0049	.1713	.1728	.0015	.1510	.1541	.0031	.1510	.1541	.0031
20	.320	18	.1918	.1980	.0062	.1647	.1664	.0017	.1377	.1412	.0035	.1377	.1412	.0035
22	.346	16	.2178	.2240	.0062	.1907	.1924	.0017	.1637	.1672	.0035	.1637	.1672	.0035
24	.372	18	.2439	.2511	.0072	.2114	.2132	.0018	.1789	.1826	.0037	.1789	.1826	.0037
26	.398	14	.2699	.2771	.0072	.2374	.2392	.0018	.2049	.2086	.0037	.2049	.2086	.0037
28	.424	16	.2959	.3039	.0080	.2598	.2618	.0020	.2237	.2276	.0039	.2237	.2276	.0039
30	.450	16	.3219	.3299	.0080	.2858	.2878	.0020	.2497	.2536	.0039	.2497	.2536	.0039
			.3480	.3568	.0088	.3074	.3094	.0020	.2668	.2708	.0040	.2668	.2708	.0040
			.3739	.3819	.0080	.3378	.3398	.0020	.3017	.3056	.0039	.3017	.3056	.0039
			.4001	.4099	.0098	.3537	.3558	.0021	.3073	.3114	.0041	.3073	.3114	.0041
			.4260	.4348	.0088	.3854	.3874	.0020	.3448	.3488	.0040	.3448	.3488	.0040
			.4520	.4608	.0088	.4114	.4134	.0020	.3708	.3748	.0040	.3708	.3748	.0040

Note: Our "go" or minimum male thread gages for tapped holes are made to the "basic" or maximum screw P. D. given on page 336. In other respects our regular ASME Std. gages control sizes as given in these tables.



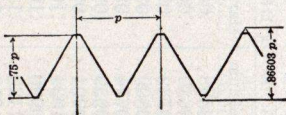
Comparison of Various 60° Thread Forms

"SHARP" V THREAD



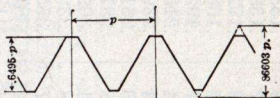
Purely a theoretical thread form, as the sharp crest and root cannot be produced **except in figures**. Is useful only as a basis for laying out other thread forms.

"MODIFIED" V THREAD



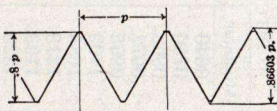
A practical modification of the "Sharp" V form, but not recommended because of difficulty in maintaining crest and root of thread to correct form which is very nearly sharp. Pitch diameter on screws of this form will be larger than P. D. of "Sharp" V form by $2 \times$ truncation or $2 \times .058 P$.

U. S. STANDARD THREAD



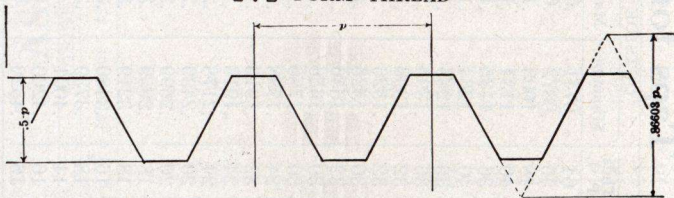
A practical 60° thread form originated by Mr. William Sellers. Used in preference to sharper "V" forms by all who have given thought to the subject. Its weakness lies in the fact that in the finer pitches the flat at crest and root is very nearly sharp and crest clearance cannot be given without destroying the basic outline. Pitch diameter is $2 \times .1082$ larger than of "Sharp" V.

BRIGGS STANDARD V THREAD



Also a practical modification of the "Sharp" V form, but also difficult to maintain because crest and root are so very nearly sharp. Pitch diameter on screws of this form will be larger than P. D. of "Sharp" V form by $2 \times$ truncation or $2 \times .033 P$.

GTD FORM THREAD



Recommended by the Greenfield Tap and Die Corporation as being of the maximum strength and ease of manufacture. Depth of thread is equal to the "Acme" thread depth while the base is broader. The truncation being $.183 P$ ample space for crest clearance is available. Pitch diameter is $2 \times .183 P$ larger than Sharp V and $2 \times .075$ larger than USS.

Is useful to replace fine threads on thin tubing, valve stems, etc. Suggestions for application of this thread will gladly be given.

Comparative Table of Basic Pitch Diameters

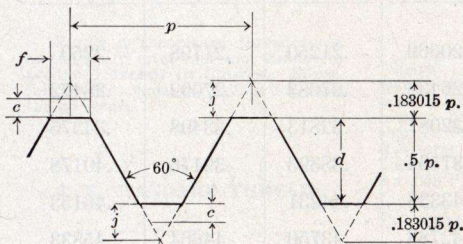
Size and T. P. I.	USS	Sharp V	75% V	Whit.	GTD Form
$\frac{1}{4}^{20}$	.21752	.20669	.21250	.21798	.2250
$\frac{5}{16}^{18}$	.27641	.26438	.27083	.27692	.28472
$\frac{3}{8}^{16}$	.33440	.32087	.32813	.33498	.34375
$\frac{7}{16}^{14}$	.39110	.37564	.38393	.39176	.40178
$\frac{1}{2}^{13}$	.45003	.43338	.44231		.46153
$\frac{1}{2}^{12}$		.42783	.43750	.44664	.45833
$\frac{9}{16}^{12}$	.50837	.49033	.5000	.50914	.52083
$\frac{5}{8}^{11}$	.56595	.56627	.55682	.56678	.57954
$\frac{11}{16}^{11}$	.62845	.60877	.61932	.62929	.64204
$\frac{3}{4}^{10}$	.68504	.66339	.67500	.68596	.7000
$\frac{13}{16}^{10}$	.74754	.72589	.73750	.74846	.76250
$\frac{7}{8}^9$	.80283	.77877	.79166	.80385	.81944
$\frac{15}{16}^9$	.86533	.84127	.85416	.86635	.88194
1 ⁸	.91881	.89174	.90625	.91995	.9375
1 $\frac{1}{8}^7$	1.03221	1.00128	1.01785	1.03352	1.05357
1 $\frac{1}{4}^7$	1.15721	1.12628	1.14285	1.15852	1.17857
1 $\frac{3}{8}^6$	1.26674	1.23066	1.250	1.26827	1.29166
1 $\frac{1}{2}^6$	1.39174	1.35566	1.375	1.39327	1.41666
1 $\frac{5}{8}^{5\frac{1}{2}}$	1.50690	1.47754	1.44318		1.44318
1 $\frac{3}{4}^5$	1.62009	1.57679	1.6000	1.62193	1.6500
1 $\frac{7}{8}^5$	1.74509	1.70179	1.725	1.74693	1.7750
2 $\frac{1}{2}^5$	1.85566	1.80755	1.83333	1.85770	1.88888

GTD Thread Form

Recommended by Greenfield Tap and Die Corporation

FORMULAE

n = number of threads per inch



$$p = \frac{1}{n}$$

$$d = \frac{.500}{n} \text{ or } \frac{p}{2}$$

$$f = \frac{.21132}{n} \text{ or } .21132 \times p$$

$$j = \frac{.183015}{n} \text{ or } .183015 \times p$$

$$c = \frac{p}{10} \text{ or } p \times .1$$

Note:

c = clearance in both male and female threads (produced by points of threading tools).

$d + c$ = actual depth cut by tools in both male and female threads.

Crest Clearance

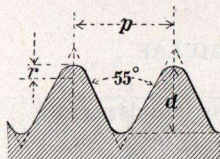
In this thread form it should be noted that we stipulate a constant for crest clearance "C" which is made part of the formula.

Crest clearance has not been definitely established for any of the commonly used thread forms, with the exception of the "Acme" and this has been a decided weakness and source of annoyance. It is true that some crest clearance has been obtained or at least striven for in some quarters by some oversize on the major and minor diameters of tapped holes and by an undersize on the major and minor diameters of male threads but there has been nothing consistent in this.

Reference to page 338 will show a comparison between the GTD and regular 60° thread forms.

Note that the corners of the clearance area "C" may be rounded without causing interference in assembly.

Whitworth Standard Thread



FORMULAE

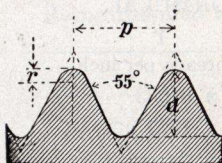
$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = \text{pitch} \times .64033$$

$$r = \text{radius} = \text{pitch} \times .1373$$

Full Diameter	Decimal Equivalent Outside Diameter	No. of Threads per Inch	Pitch	Standard Depth of Thread	Effective Diameter	Core Diameter	Cross Sectional Area at Bottom of Thread
1/4	.25	20	.0500	.03201	.2179	.1856	.0272
5/16	.3125	18	.0556	.03557	.2769	.2413	.0458
3/8	.375	16	.0625	.04002	.3349	.2949	.0683
7/16	.4375	14	.0714	.04573	.3917	.3460	.0940
1/2	.5	12	.0833	.05336	.4466	.3932	.1215
9/16	.5625	12	.0833	.05336	.5091	.4557	.1632
5/8	.625	11	.0909	.05821	.5667	.5085	.2032
11/16	.6875	11	.0909	.05821	.6292	.5710	.2562
3/4	.75	10	.1000	.06403	.6859	.6219	.3038
13/16	.8125	10	.1000	.06403	.7484	.6844	.3679
7/8	.875	9	.1111	.07114	.8038	.7327	.4216
1	1.000	8	.1250	.08004	.9199	.8399	.5540
1 1/8	1.125	7	.1429	.09147	1.0335	.9421	.6969
1 1/4	1.25	7	.1429	.09147	1.1585	1.0671	.8942
1 3/8	1.375	6	.1667	.10672	1.2682	1.1615	1.0597
1 1/2	1.5	6	.1667	.10672	1.3932	1.2865	1.3001
1 5/8	1.625	5	.2000	.12806	1.4969	1.3688	1.4718
1 3/4	1.75	5	.2000	.12806	1.6219	1.4938	1.7528
2	2.000	4 1/2	.2222	.14228	1.8577	1.7154	2.3111

British Standard Fine Screw Thread



FORMULAE

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

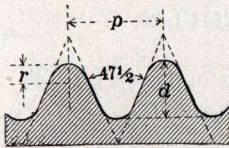
$$d = \text{depth} = \text{pitch} \times .64033$$

$$r = \text{radius} = \text{pitch} \times .1373$$

Full Diameter	Decimal Equivalent Outside Diameter (Major Diameter)	Number of Thds. to the Inch	Pitch Inches	Standard Depth of Thread	Effective Diameter (Pitch Diameter)	Core Diameter
$\frac{1}{4}$	.2500	26	.0385	.0246	.2254	.2008
$\frac{9}{32}$	.2813	26	.0385	.0246	.2566	.2321
$\frac{5}{16}$	.3125	22	.0455	.0291	.2834	.2543
$\frac{3}{8}$	.3750	20	.0500	.0320	.3430	.3110
$\frac{7}{16}$	.4375	18	.0556	.0355	.4019	.3665
$\frac{1}{2}$	.5000	16	.0625	.0400	.4600	.4200
$\frac{9}{16}$	.5625	16	.0625	.0400	.5225	.4825
$\frac{5}{8}$	.6250	14	.0714	.0457	.5793	.5336
$1\frac{1}{16}$	.6875	14	.0714	.0457	.6418	.5961
$\frac{3}{4}$	.7500	12	.0833	.0533	.6966	.6434
$1\frac{3}{16}$	.8125	12	.0833	.0533	.7591	.7059
$\frac{7}{8}$	.8750	11	.0909	.0582	.8168	.7586
1	1.0000	10	.1000	.0640	.9360	.8720
$1\frac{1}{8}$	1.1250	9	.1111	.0711	1.0539	.9828
$1\frac{1}{4}$	1.2500	9	.1111	.0711	1.1789	1.1078
$1\frac{3}{8}$	1.3750	8	.1250	.0800	1.2950	1.2150
$1\frac{1}{2}$	1.5000	8	.1250	.0800	1.4200	1.3400

British Association Screw Thread

FORMULAE



$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = \text{pitch} \times .6$$

$$r = \text{radius} = \frac{2 \times \text{pitch}}{11}$$

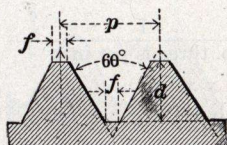
Schedule of Sizes

No.	Diameter (Major Diameter) mm.	Approximate Diameter Inches	Pitch mm.	Approximate Pitch Inches	Depth of Thread mm.	Effective Diameter (Pitch Diameter) mm.	Core Diameter (Minor Diameter) mm.	Approximate Cross Sectional Area at Bottom of Thread mm.
0	6.0	.236	1.00	.0394	.600	5.400	4.80	18.10
1	5.3	.209	.90	.0354	.540	4.760	4.22	13.99
2	4.7	.185	.81	.0319	.485	4.215	3.73	10.93
3	4.1	.161	.73	.0287	.440	3.660	3.22	8.14
4	3.6	.142	.66	.0260	.395	3.205	2.81	6.20
5	3.2	.126	.59	.0232	.355	2.845	2.49	4.87
6	2.8	.110	.53	.0209	.320	2.480	2.16	3.66
7	2.5	.098	.48	.0189	.290	2.210	1.92	2.89
8	2.2	.087	.43	.0169	.260	1.940	1.68	2.22
9	1.9	.075	.39	.0154	.235	1.665	1.43	1.61
10	1.7	.067	.35	.0138	.210	1.490	1.28	1.29
11	1.5	.059	.31	.0122	.185	1.315	1.13	1.00
12	1.3	.051	.28	.0110	.170	1.130	.96	.72

The figures in columns 3, 5 and 9 are given for convenience only, and should in no case be worked to, where satisfactory interchangeability is required.

Metric Screw Thread

(US FORM)



FORMULAE

$$p = \text{pitch} = \frac{1}{\text{No. of threads per inch}}$$

$$d = \text{depth} = \text{pitch} \times .6495$$

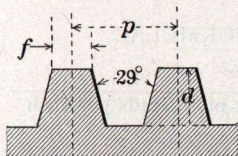
$$f = \text{flat} = \frac{\text{pitch}}{8}$$

Table of Most Commonly Used Sizes

Size Major Diameter mm.	PITCH		Size Major Diameter mm.	PITCH	
	International Standard	French Standard		International Standard	French Standard
2	.45	...	20	2.50	2.50
2.5	.45	...			
3	.60	.50	22	2.50	2.50
3.5	.60	...			
4	.75	.75	24	3.00	3.00
4.5	.75	...			
5	.90	.75	26	...	3.00
5.5	.90	...			
6	1.00	1.00	27	3.00	...
7	1.00	1.00	28	...	3.00
8	1.25	{ 1.00 1.25	30	3.50	3.50
9	1.25	{ 1.00 1.25	32	...	3.50
10	1.50	1.50	33	3.50	3.50
11	1.50	1.50	34	...	3.50
12	1.75	{ 1.50 1.75	36	4.00	4.00
14	2.00	2.00	38	...	4.00
16	2.00	2.00	39	4.00	4.00
18	2.50	2.50	40	...	4.00

Acme Standard Screw Thread

FORMULAE



$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = \frac{1}{2} \text{ pitch} + .010''$$

$$f = \text{flat on top} = \text{pitch} \times .3707$$

The Acme Standard Thread is an adaptation of the most commonly used style of Worm Thread and is intended to take the place of the square thread.

It is a little more shallow than the Worm Thread, but the same depth as the square thread and much stronger than the latter.

The various parts of the Acme Standard Thread are obtained as follows:

$$\left. \begin{array}{l} \text{Width of Point of Tool for} \\ \text{Screw or Tap Thread} \end{array} \right\} = \frac{.3707}{\text{No. of Threads to the inch}} - .0052''$$

$$\text{Width of screw or nut} = \frac{.3707}{\text{No. of Threads to the inch}}$$

$$\text{Diameter of Tap} = \text{Diameter of Screw} + .020''$$

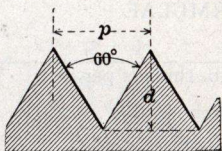
$$\left. \begin{array}{l} \text{Diameter of Tap} \\ \text{or Screw at root} \end{array} \right\} = \left. \begin{array}{l} \text{Diameter} \\ \text{of Screw} \end{array} \right\} - \left(\frac{1}{\text{No. of Threads to inch}} + .020'' \right)$$

$$\text{Depth of Thread} = \frac{1}{2 \times \text{No. of Threads to the inch}} + .010''$$

Table of Proportions

Number of Threads to the Linear Inch	Depth of Thread	Width of Crest of Thread	Width of Root of Thread	Space at Crest of Thread	Space at Root of Thread
1	.5100	.3707	.3655	.6293	.6345
2	.2600	.1853	.1801	.3147	.3199
3	.1767	.1235	.1183	.2098	.2150
4	.1350	.0927	.0875	.1573	.1625
5	.1100	.0741	.0689	.1259	.1311
6	.0933	.0618	.0566	.1049	.1101
7	.0814	.0529	.0478	.0899	.0951
8	.0725	.0463	.0411	.0787	.0839
9	.0655	.0413	.0361	.0699	.0751
10	.0600	.0371	.0319	.0629	.0681

Sharp V Thread



FORMULAE

$$p = \text{pitch} = \frac{1}{\text{No. of Threads per Inch}}$$

$$d = \text{depth} = p \times .86603$$

A WARNING

The V thread is not a standard, never was, and never will be. It is an impossible thread to produce.

This is evident when it is considered that the razor-like apex of a theoretical V thread (supposing it to be possible to make it at all) would break off at the first use and the screw lose its nominal size immediately.

Because of this, various manufacturers have from time to time adopted certain modifications of the theoretical V form (allowing a flat at both top and bottom of thread) which seemed to meet their own requirements.

WE DO NOT RECOMMEND

any of the various modifications of the theoretical V thread because interchangeability is restricted, if not made altogether impossible because of probable interference at crest and root of thread.

The USS thread, used by the Army and Navy Departments, as well as by the vast majority of manufacturers and on the great railway systems of the country, is a standard—having uniform diameter, pitch, angle of thread wall and flat at top and bottom. We recommend it for standard work.

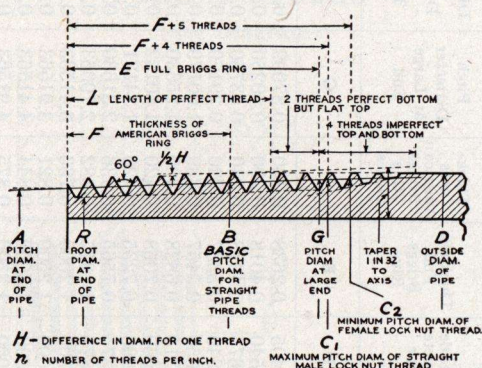
It is only a question of a few years until the V thread with its "oversize" and "exact," its various modifications and the interminable threading difficulties which follow its use, will be obsolete. Because of this we furnish the V thread only when specifically requested and at special prices.

Note:—We will not guarantee to supply thread gages to full size at crest of thread in "Sharp" V form.

Where V threads are considered necessary, we advise modification of full V form so that depth of thread is .750P. instead of .86603P. as shown above.

By all means, advise us of the pitch diameter required when V thread taps, dies or gages are wanted.

Briggs Standard Pipe Thread



Formulae For Basic Sizes

The report of the Committee on Standard Pipe and Pipe Threads presented to the American Society of Mechanical Engineers in 1886, Paper CCXXVI, and supplemented by the report of the Committee on Gages above mentioned, gives standard dimensions of pipe and certain formulae shown in above. In this figure

$$L = \frac{0.8D + 4.8}{n}$$

$$E = L + 2 \left(\frac{1}{n} \right)$$

$$R = D - \frac{0.05D + 1.9}{n}$$

$$A = R + \frac{0.8}{n}$$

$$B = A + \frac{F}{16}$$

$$G = A + \frac{E}{16}$$

$$\text{Depth of Thread} = \frac{0.8}{n}$$

$$H = \frac{1}{16n}$$

$$\text{Included taper} = \frac{3}{4}'' \text{ per foot}$$

$$N = \text{No. of T. P. I.}$$

The sizes shown in diagram and above described were adopted by the Committee of Manufacturers on Standardization of Fittings and Valves on September 17, 1913, except the straight pipe thread and locknut sizes.

Straight pipe and locknut sizes were later adopted by the same committee on March 16, 1915. The figures for the various pipe sizes as published by that committee are given in table on page 348, with the addition of columns headed D, G and H.

For tables of sizes of Briggs Standard Straight and Taper Pipe Sizes, see page 348.



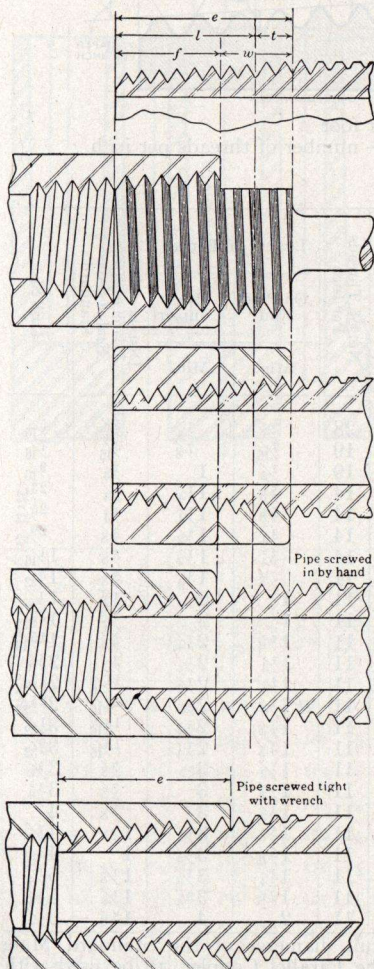
American Briggs Pipe Standard Locknut Threads and Basic Straight Pipe Sizes

Pipe Size Inches	Threads per Inch	Depth of Thread	Pitch Diameter End of Pipe	Pitch Diameter at Gage Notch Basic Straight	Maximum Pitch Diameter Straight Male Locknut Thread	Minimum Pitch Diameter Straight Female Locknut Thread	Outside Diameter Pipe	Thickness Full Briggs Ring	Thickness American Briggs Ring Inches	Pitch Diameter at Large End	Difference in Diameter One Thread
	n	$\frac{0.8}{n}$	A	B	C1	C2	D	E	F	G	H
$\frac{1}{8}$	27	0.02962	0.36350	0.37475	0.38400	0.38632	0.405	0.2638	0.180	0.37999	0.00232
$\frac{1}{4}$	18	0.04444	0.47739	0.48989	0.50378	0.50725	0.540	0.4018	0.200	0.50250	0.00347
$\frac{3}{8}$	18	0.04444	0.61201	0.62701	0.64090	0.64437	0.675	0.4078	0.240	0.63750	0.00347
$\frac{1}{2}$	14	0.05714	0.75843	0.77843	0.79628	0.80075	0.840	0.5337	0.320	0.79179	0.00446
$\frac{3}{4}$	14	0.05714	0.96768	0.98886	1.00671	1.01118	1.050	0.5457	0.339	1.00179	0.00446
1	11 $\frac{1}{2}$	0.06956	1.21363	1.23863	1.26036	1.26580	1.315	0.6828	0.400	1.25630	0.00543
1 $\frac{1}{4}$	11 $\frac{1}{2}$	0.06956	1.55713	1.58338	1.60511	1.61055	1.660	0.7068	0.420	1.60132	0.00543
1 $\frac{1}{2}$	11 $\frac{1}{2}$	0.06956	1.79609	1.82234	1.84407	1.84951	1.900	0.7235	0.420	1.84131	0.00543
2	11 $\frac{1}{2}$	0.06956	2.26902	2.29627	2.31801	2.32344	2.375	0.7565	0.436	2.31630	0.00543
2 $\frac{1}{2}$	8	0.10000	2.71954	2.76216	2.79341	2.80122	2.875	1.1375	0.682	2.79063	0.00781
3	8	0.10000	3.34063	3.38850	3.41975	3.42756	3.500	1.2000	0.766	3.41563	0.00781
3 $\frac{1}{2}$	8	0.10000	3.83750	3.88881	3.92006	3.92787	4.000	1.2500	0.821	3.91563	0.00781
4	8	0.10000	4.33438	4.38713	4.41838	4.42619	4.500	1.3000	0.844	4.41563	0.00781
4 $\frac{1}{2}$	8	0.10000	4.83125	4.88593	4.91718	4.92499	5.000	1.3500	0.875	4.91563	0.00781
5	8	0.10000	5.39074	5.44930	5.48055	5.48836	5.563	1.4063	0.937	5.47863	0.00781
6	8	0.10000	6.44610	6.50597	6.53722	6.54503	6.625	1.5125	0.958	6.54063	0.00781

For sizes above 6 inches, the formulae on preceding page should also be used.

Relationship of Gages to Taper Pipe Threads

(See Diagram)



"l" = Length of perfect threads,

"t" = Two threads more than "L."

"e" = Thickness of "Full Briggs Ring."

"f" = Thickness of "American Briggs Ring."

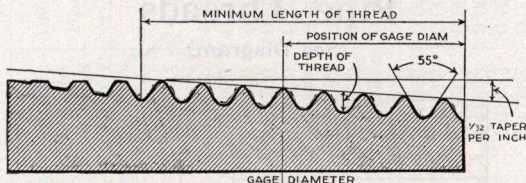
"w" = Amount to be screwed up by wrench to make tight joint.

See pages 347 and 348 for other data on Briggs Standard Thread.



British Standard Pipe Thread

Whitworth Form



Included taper $\frac{3}{4}$ inch per foot

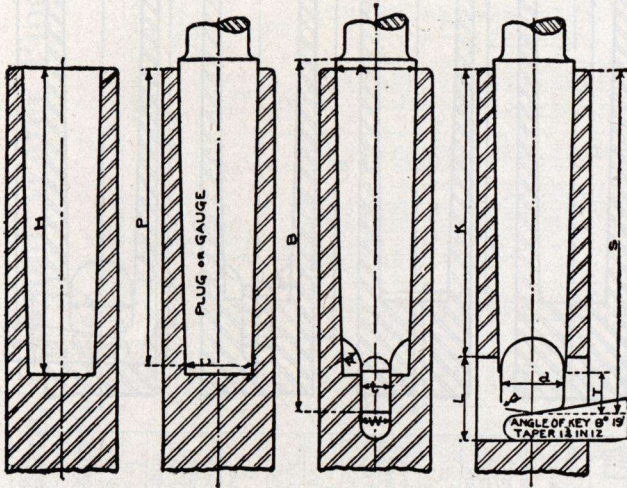
Depth of thread = $.6403 \div \text{number of threads per inch}$

$.6403 \text{ P or } \frac{.6403}{n}$

Nominal Size	Approximate Outside Diameter	*Gage Diameter	Depth of Thread	No. of Threads Per Inch	Length of Thread		Distance of Gage Diameter from End of Pipe—Standard	Drill Size
					On Pipe End	In Coupler		
					Min.	Min.		
$\frac{1}{8}$	$\frac{13}{32}$	.383	.0230	28	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{5}{32}$	$\frac{5}{16}$
$\frac{1}{4}$	$\frac{17}{32}$	.518	.0335	19	$\frac{7}{16}$	$\frac{7}{8}$	$\frac{3}{16}$	$\frac{7}{16}$
$\frac{3}{8}$	$\frac{11}{16}$	.656	.0335	19	$\frac{1}{2}$	1	$\frac{1}{4}$	$\frac{9}{16}$
$\frac{1}{2}$	$\frac{27}{32}$	.825	.0455	14	$\frac{5}{8}$	$1\frac{1}{4}$	$\frac{1}{4}$	$\frac{23}{32}$
$\frac{5}{8}$	$\frac{15}{16}$	.902	.0455	14	$\frac{5}{8}$	$1\frac{1}{4}$	$\frac{1}{4}$	$\frac{25}{32}$
$\frac{3}{4}$	$\frac{11}{16}$	1.041	.0455	14	$\frac{3}{4}$	$1\frac{1}{2}$	$\frac{3}{8}$	$\frac{29}{32}$
$\frac{7}{8}$	$\frac{17}{32}$	1.189	.0455	14	$\frac{3}{4}$	$1\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{16}$
1	$\frac{11}{16}$	1.309	.0580	11	$\frac{7}{8}$	$1\frac{3}{4}$	$\frac{3}{8}$	$1\frac{5}{32}$
$1\frac{1}{4}$	$\frac{11}{16}$	1.650	.0580	11	1	2	$\frac{1}{2}$	$1\frac{1}{2}$
$1\frac{1}{2}$	$1\frac{1}{2}$	1.882	.0580	11	1	2	$\frac{1}{2}$	$1\frac{23}{32}$
$1\frac{3}{4}$	$\frac{25}{32}$	2.116	.0580	11	$1\frac{1}{8}$	$2\frac{1}{4}$	$\frac{5}{8}$	$1\frac{15}{16}$
2	$\frac{23}{8}$	2.347	.0580	11	$1\frac{1}{4}$	$2\frac{1}{4}$	$\frac{5}{8}$	$2\frac{3}{16}$
$2\frac{1}{4}$	$2\frac{5}{8}$	2.587	.0580	11	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{11}{16}$	$2\frac{13}{32}$
$2\frac{1}{2}$	3	2.960	.0580	11	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{11}{16}$	$2\frac{25}{32}$
$2\frac{3}{4}$	$3\frac{1}{4}$	3.210	.0580	11	$1\frac{3}{8}$	$2\frac{3}{4}$	$\frac{13}{16}$	$3\frac{1}{32}$
3	$3\frac{1}{2}$	3.460	.0580	11	$1\frac{3}{8}$	$2\frac{3}{4}$	$\frac{13}{16}$	$3\frac{9}{32}$
$3\frac{1}{4}$	$3\frac{3}{4}$	3.700	.0580	11	$1\frac{1}{2}$	3	$\frac{7}{8}$	$3\frac{1}{2}$
$3\frac{1}{2}$	4	3.950	.0580	11	$1\frac{1}{2}$	3	$\frac{7}{8}$	$3\frac{3}{4}$
$3\frac{3}{4}$	$4\frac{1}{4}$	4.200	.0580	11	$1\frac{1}{2}$	3	$\frac{7}{8}$	4
4	$4\frac{1}{2}$	4.450	.0580	11	$1\frac{5}{8}$	$3\frac{1}{4}$	1	$4\frac{1}{4}$
$4\frac{1}{2}$	5	4.950	.0580	11	$1\frac{5}{8}$	$3\frac{1}{4}$	1	$4\frac{3}{4}$
5	$5\frac{1}{2}$	5.450	.0580	11	$1\frac{3}{4}$	$3\frac{1}{2}$	$1\frac{1}{8}$	$5\frac{1}{4}$
$5\frac{1}{2}$	6	5.950	.0580	11	$1\frac{7}{8}$	$3\frac{3}{4}$	$1\frac{1}{4}$	$5\frac{3}{4}$
6	$6\frac{1}{2}$	6.450	.0580	11	2	4	$1\frac{3}{8}$	$6\frac{1}{4}$

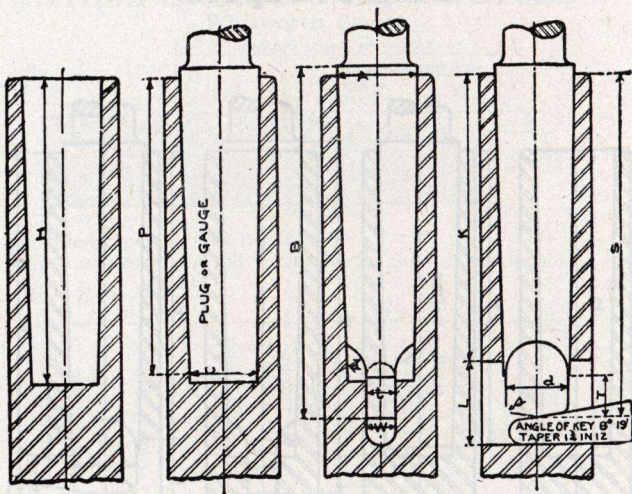
*Gage Diameter is the full diameter of the Standard Male Parallel Screw Gage which the Parallel Coupler, to be used with a pipe of that size, is required to fit.

Morse Tapers



No. of Taper	Diam. of Plug at Small End	Diam. at End of Socket	Standard Plug Depth	Whole Length of Shank	Depth of Hole	End of Socket to Keyway	Length of Keyway	Width of Keyway	Length of Tongue	Diam. of Tongue	Thickness of Tongue	Radius of Mill for Tongue	Radius of Tongue	Shank Depth	Taper per Foot	Taper per inch	No. of Key
	D	A	P	B	H	K	L	W	T	d	t	R	a	S			
0	.252	.356	2	2 ³ / ₈	2 ¹ / ₃₂	1 ¹⁵ / ₁₆	⁹ / ₁₆	.160	⁹ / ₃₂	.24	⁵ / ₃₂	⁵ / ₃₂	.04	2 ¹ / ₄	.625	.05208	0
1	.369	.475	2 ¹ / ₈	2 ⁵ / ₈	2 ³ / ₁₆	2 ¹ / ₁₆	³ / ₄	.213	³ / ₈	.35	1 ³ / ₆₄	³ / ₁₆	.05	2 ⁷ / ₁₆	.600	.05	1
2	.572	.700	2 ⁹ / ₁₆	3 ¹ / ₈	2 ⁵ / ₈	2 ¹ / ₂	⁷ / ₈	.260	³ / ₁₆	.55	¹ / ₄	¹ / ₄	.06	2 ¹⁵ / ₁₆	.602	.05016	2
3	.778	.938	3 ³ / ₁₆	3 ⁷ / ₈	3 ¹ / ₄	3 ¹ / ₁₆	1 ¹ / ₁₆	.322	⁹ / ₁₆	.75	⁵ / ₁₆	⁹ / ₃₂	.08	3 ¹¹ / ₁₆	.602	.05016	3
4	1.02	1.231	4 ¹ / ₁₆	4 ⁷ / ₈	4 ¹ / ₈	3 ⁷ / ₈	1 ¹ / ₄	.478	⁵ / ₈	.98	1 ⁵ / ₃₂	⁵ / ₁₆	.10	4 ⁵ / ₈	.623	.05191	4
5	1.475	1.748	5 ³ / ₁₆	6 ¹ / ₈	5 ¹ / ₄	4 ¹⁵ / ₁₆	1 ¹ / ₂	.635	³ / ₄	1.41	⁵ / ₈	³ / ₈	.12	5 ⁷ / ₈	.630	.0525	5
6	2.116	2.494	7 ¹ / ₄	8 ⁵ / ₈	7 ³ / ₈	7	1 ³ / ₄	.76	1 ¹ / ₈	2.00	³ / ₄	¹ / ₂	.15	8 ¹ / ₄	.626	.05216	6
7	2.75	3.27	10	11 ³ / ₄	10 ¹ / ₈	9 ¹ / ₂	2 ⁵ / ₈	1.135	1 ¹ / ₂	2 ¹ / ₁₆	1 ¹ / ₈	³ / ₄	.18	11 ³ / ₈	.625	.05208	7

Brown & Sharpe Tapers



No. of Taper	Diam. of Plug at Small End	Diam. at End of Socket	Standard Plug Depth	Whole Length of Shank	Depth of Hole	End of Socket to Keyway	Length of Keyway	Width of Keyway	Length of Tongue	Diam. of Tongue	Thickness of Tongue	Radius of Mill for Tongue	Radius of Tongue	Shank Depth	Taper per Foot	Taper per Inch
	D	A	P	B	H	K	L	W	T	d	t	R	a	S		
4	.35	.402	1 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{8}$	1 $\frac{13}{64}$	$\frac{11}{16}$	.228	1 $\frac{11}{32}$	.320	$\frac{7}{32}$	$\frac{3}{16}$	.050	1 $\frac{21}{32}$	.500	.0416
5	.45	.5229	1 $\frac{3}{4}$	2 $\frac{9}{32}$	1 $\frac{7}{8}$	1 $\frac{19}{16}$	$\frac{3}{4}$	.260	$\frac{3}{8}$	.420	$\frac{1}{4}$	$\frac{5}{16}$	.060	2 $\frac{3}{16}$	.500	.0416
6	.50	.599	2 $\frac{3}{8}$	2 $\frac{31}{32}$	2 $\frac{1}{2}$	2 $\frac{19}{64}$	$\frac{7}{8}$	.291	$\frac{7}{16}$	.460	$\frac{9}{32}$	$\frac{3}{16}$	.060	2 $\frac{7}{8}$	.500	.0416
6	.50	.6354	3 $\frac{1}{4}$	3 $\frac{27}{32}$	3 $\frac{3}{8}$	3 $\frac{11}{64}$	$\frac{7}{8}$	.291	$\frac{7}{16}$	.460	$\frac{9}{32}$	$\frac{5}{16}$	.060	3 $\frac{3}{4}$	.500	.0416
7	.60	.725	3	3 $\frac{5}{8}$	3 $\frac{1}{8}$	2 $\frac{29}{32}$	$\frac{15}{16}$	.322	1 $\frac{5}{32}$	.560	$\frac{5}{16}$	$\frac{3}{8}$	.070	3 $\frac{17}{32}$	.500	.0416
7	.60	.7667	4	4 $\frac{5}{8}$	4 $\frac{1}{8}$	3 $\frac{29}{32}$	$\frac{15}{16}$	.322	1 $\frac{5}{32}$	.560	$\frac{5}{16}$	$\frac{3}{8}$	.070	4 $\frac{17}{32}$	.500	.0416
8	.75	.8985	3 $\frac{3}{16}$	4 $\frac{1}{4}$	3 $\frac{3}{16}$	3 $\frac{29}{32}$	1	.353	$\frac{1}{2}$	.710	1 $\frac{11}{32}$	$\frac{3}{8}$	.080	4 $\frac{1}{8}$	.500	.0416
	.90	1.0667	4	4 $\frac{3}{4}$	4 $\frac{1}{8}$	3 $\frac{7}{8}$	1 $\frac{1}{8}$	.385	$\frac{9}{16}$	.860	$\frac{3}{8}$	$\frac{7}{16}$	.100	4 $\frac{5}{8}$	.500	.0416
0	1.0446	1.26	5	6 $\frac{1}{16}$	5 $\frac{1}{8}$	4 $\frac{27}{32}$	1 $\frac{5}{16}$	.447	2 $\frac{1}{32}$	1.01	$\frac{7}{16}$	$\frac{1}{2}$	.110	5 $\frac{23}{32}$	.5161	.043
10	1.0446	1.289	5 $\frac{1}{16}$	6 $\frac{3}{4}$	5 $\frac{13}{16}$	5 $\frac{17}{32}$	1 $\frac{5}{16}$	.447	2 $\frac{1}{32}$	1.01	$\frac{7}{16}$	$\frac{1}{2}$	.110	6 $\frac{13}{32}$	.5161	.043
10	1.0446	1.312	6 $\frac{7}{32}$	7 $\frac{9}{32}$	6 $\frac{11}{32}$	6 $\frac{1}{16}$	1 $\frac{5}{16}$	.447	2 $\frac{1}{32}$	1.01	$\frac{7}{16}$	$\frac{1}{2}$	.110	6 $\frac{5}{16}$	.5161	.043
11	1.25	1.53	6 $\frac{3}{4}$	7 $\frac{13}{16}$	6 $\frac{7}{8}$	6 $\frac{19}{32}$	1 $\frac{5}{16}$	.447	2 $\frac{1}{32}$	1.21	$\frac{7}{16}$	$\frac{1}{2}$	.130	7 $\frac{15}{32}$	.500	.0416
12	1.50	1.797	7 $\frac{7}{8}$	8 $\frac{9}{32}$	7 $\frac{1}{4}$	6 $\frac{15}{16}$	1 $\frac{1}{2}$	.510	$\frac{3}{4}$	1.46	$\frac{1}{2}$	$\frac{1}{2}$	.150	7 $\frac{15}{16}$	.500	.0416

Standard Wrought Steam, Gas and Water Pipe

Table of Standard Dimensions

Diameter		Circumference		Transverse Areas		Length of Pipe Per Sq. Ft. of		Length of Pipe Containing One Cubic Foot		Nominal Weight Per Foot				Number of Threads per Inch of Screw
Internal	External	Internal	External	Internal	External	External Surface	Internal Surface	Feet	Feet	Plain End	Threaded and Coupled	Plain Ends	Cop- per	
Ins.	Ins.	Ins.	Ins.	Sq. Ins.	Sq. Ins.	Feet	Feet							
1 1/8	.405	1.272	.845	.057	.072	9.431	14.199	2533.775	.244	.245	.245	.25	.26	27
1 1/4	.540	1.696	1.144	.104	.125	7.073	10.493	1383.789	.424	.425	.425	.43	.46	18
1 3/8	.675	2.121	1.549	.191	.167	5.658	7.747	754.360	.567	.568	.568	.62	.64	18
1 1/2	.840	2.639	1.954	.304	.250	4.547	6.141	473.906	.850	.852	.852	.90	.96	14
1 3/4	1.050	3.299	2.589	.533	.333	3.637	4.635	270.034	1.130	1.134	1.134	1.25	1.30	14
1 7/8	1.315	4.131	3.296	.864	.494	2.904	3.641	166.618	1.678	1.684	1.684	1.70	1.83	11 1/2
2	1.660	5.215	4.335	1.495	.669	2.301	2.767	96.273	2.272	2.281	2.281	2.50	2.69	11 1/2
2 1/4	1.900	5.969	5.058	2.835	.799	2.010	2.372	70.733	2.717	2.731	2.731	3.00	3.20	11 1/2
2 1/2	2.375	7.461	6.494	3.355	1.075	1.608	1.847	42.913	3.652	3.678	3.678	4.00	4.23	8
2 3/4	2.875	9.032	7.757	6.492	1.704	1.328	1.547	30.077	5.793	5.819	5.819	5.83	6.13	8
3	3.500	10.996	9.638	9.621	2.228	1.091	1.245	19.479	7.575	7.616	7.616	8.32	8.75	8
3 1/2	3.548	12.566	11.146	9.886	2.680	.954	1.076	14.565	9.109	9.202	9.202	10.85	11.41	8
4	4.000	14.137	12.648	12.730	3.174	.848	.848	11.312	10.790	10.889	10.889	12.30	12.94	8
4 1/2	4.506	15.708	14.156	15.947	3.688	.763	.847	9.032	12.538	12.642	12.642	13.74	14.46	8
5	5.563	17.477	15.856	20.006	4.300	.686	.756	7.198	14.617	14.810	14.810	15.40	16.20	8
6	6.625	20.813	19.054	28.891	5.581	.576	.629	4.984	18.974	19.185	19.185	18.44	19.41	8
7	7.625	23.955	22.063	34.472	6.926	.500	.543	3.717	23.544	23.769	23.769	23.92	25.17	8
8	8.625	27.096	25.356	45.664	8.738	.442	.473	2.815	24.696	25.000	25.000	30.06	31.63	8
8 1/2	8.971	27.096	25.073	50.027	9.399	.427	.478	2.878	28.554	28.809	28.809			8
9	9.625	30.238	28.089	62.786	9.974	.396	.427	2.294	33.907	34.188	34.188			8
10	10.750	33.772	32.019	81.585	9.178	.355	.374	1.765	31.201	32.000	32.000			8
10 1/2	10.750	33.772	31.843	90.763	10.072	.355	.376	1.785	34.240	35.000	35.000			8
11	10.750	33.772	31.479	90.763	11.908	.355	.381	1.826	40.483	41.132	41.132			8

Extra Strong Wrought Pipe

Table of Standard Dimensions

Diameter			Nominal Thickness		Circumference		Transverse Areas			Length of Pipe per Square Foot of		Length of Pipe Containing One Cubic Foot	Nominal Weight per Foot Plain Ends		
Nominal	External	Approximate Internal	Ins.	Ins.	External	Internal	External	Internal	Metal	External Surface	Internal Surface		Iron	Brass	Copper
Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Sq. Ins.	Sq. Ins.	Sq. Ins.	Feet	Feet	Feet	Lbs.	Lbs.	Lbs.
1/8	.405	.215	.095	1.272	.675	.129	.086	.093	.093	9.431	17.766	3966.392	.314	.35	.37
1/4	.540	.302	.119	1.696	.949	.229	.072	.157	.157	7.073	12.648	2010.290	.535	.59	.62
3/8	.675	.423	.126	2.121	1.329	.358	.141	.217	.217	5.658	9.030	1024.689	.738	.80	.85
1/2	.840	.546	.147	2.639	1.715	.554	.234	.320	.320	4.547	6.995	615.017	1.087	1.19	1.25
3/4	1.050	.742	.154	3.299	2.331	.866	.433	.433	.433	3.637	5.147	333.016	1.473	1.62	1.71
1	1.315	.957	.179	4.131	3.007	1.358	.719	.639	.639	.904	3.991	200.193	2.171	2.39	2.51
1 1/4	1.660	1.278	.191	5.215	4.015	2.164	1.283	.881	.881	2.301	2.988	112.256	2.996	3.29	3.46
1 1/2	1.900	1.500	.200	5.969	4.712	2.835	1.767	1.068	1.068	2.010	2.546	81.487	3.631	3.99	4.19
2	2.375	1.939	.218	7.461	6.092	4.430	2.953	1.477	1.477	1.608	1.969	48.766	5.022	5.51	5.80
2 1/2	2.875	2.323	.276	9.032	7.298	6.492	4.238	2.254	2.254	1.328	1.644	33.976	7.661	8.41	8.85
3	3.500	2.900	.300	10.996	9.111	9.621	6.605	3.016	3.016	1.091	1.317	21.801	10.252	11.24	11.83
3 1/2	4.000	3.364	.318	12.566	10.568	12.566	8.888	3.678	3.678	.954	1.135	16.202	12.505	13.67	14.38
4	4.500	3.826	.337	14.137	12.020	15.804	11.497	4.407	4.407	.848	.998	12.525	14.983	16.41	17.27
4 1/2	5.000	4.290	.355	15.708	13.477	19.635	14.455	5.180	5.180	.763	.890	9.962	17.611	20.07	21.12
5	5.563	4.813	.375	17.477	15.120	24.306	18.194	6.112	6.112	.686	.793	7.915	20.778	22.52	23.69
6	6.625	5.761	.432	20.813	18.099	34.472	26.067	8.405	8.405	.576	.663	5.524	28.573	31.33	32.96
7	7.625	6.625	.500	23.955	20.813	45.664	34.472	11.192	11.192	.500	.576	4.177	38.048	41.23	43.38
8	8.625	7.625	.500	27.096	23.955	58.426	45.663	12.763	12.763	.442	.500	3.154	43.388	47.02	49.47
9	9.625	8.625	.500	30.238	27.096	72.760	58.426	14.334	14.334	.396	.442	2.464	48.728		
10	10.750	9.750	.500	33.772	30.631	90.763	74.662	16.101	16.101	.355	.396	1.929	54.735		
11	11.750	10.750	.500	36.914	33.772	108.434	90.763	17.671	17.671	.325	.355	1.557	60.075		
12	12.750	11.750	.500	40.055	36.914	127.676	108.434	19.242	19.242	.299	.325	1.328	65.415		

Double Extra Strong Wrought Pipe

Table of Standard Dimensions

Diameter			Circumference		Transverse Areas			Length of Pipe Per Sq. Foot of		Length of Pipe Containing One Cubic Foot		Normal Weight Per Foot Plain Ends	
Internal	External	Approximate Internal	Ins.	External	Ins.	External	Sq. Ins.	Internal	Sq. Ins.	Feet	Feet	Lbs.	Lbs.
1/2	840	252	2.639	7.92	.554	.050	.504	4.547	15.157	2887.164	2887.164	1.714	1.714
3/4	1.050	.434	3.299	1.363	.866	.148	.718	3.637	8.801	973.404	973.404	2.440	2.440
1	1.315	.599	4.131	1.882	1.358	.282	1.076	2.904	6.376	510.998	510.998	3.659	3.659
1 1/4	1.660	.896	5.215	2.815	2.164	.630	1.534	2.301	4.263	228.379	228.379	5.214	5.214
1 1/2	1.900	1.100	5.969	3.456	2.835	.950	1.885	2.010	3.472	151.526	151.526	6.408	6.408
2	2.375	1.503	7.461	4.722	4.430	1.774	2.656	1.608	2.541	81.162	81.162	9.029	9.029
2 1/2	2.875	1.771	9.032	5.564	6.492	2.464	4.028	1.328	2.156	58.457	58.457	13.695	13.695
3	3.500	2.300	10.996	7.226	9.621	4.155	5.466	1.091	1.660	34.659	34.659	18.583	18.583
3 1/2	4.000	2.728	12.566	8.570	12.566	5.845	6.721	.954	1.400	24.637	24.637	22.850	22.850
4	4.500	3.152	14.137	9.902	15.904	7.803	8.101	.848	1.211	18.454	18.454	27.541	27.541
4 1/2	5.000	3.580	15.708	11.247	19.635	10.066	9.569	.763	1.066	14.306	14.306	23.530	23.530
5	5.563	4.063	17.477	12.764	24.306	12.966	11.340	.686	.940	11.107	11.107	38.552	38.552
6	6.625	4.897	20.813	15.384	34.472	18.835	15.637	.576	.780	7.646	7.646	53.160	53.160
7	7.625	5.875	23.955	18.457	45.664	27.109	18.555	.500	.650	5.312	5.312	63.079	63.079
8	8.625	6.875	27.096	21.598	58.426	37.122	21.304	.442	.555	3.879	3.879	72.424	72.424



U. S. Standard Gage

For Uncoated Sheets and Plates of Iron

No. of Gage	Weight Per Square Foot in Pounds	Thickness	Decimal Points of An Inch
0000000	20	1-2"	.5
000000	18.75	15-32"	.46875
00000	17.50	7-16"	.4375
0000	16.25	13-32"	.40625
000	15.	3-8"	.375
00	13.75	11-32"	.34375
0	12.50	5-16"	.3125
1	11.25	9-32"	.28125
2	10.625	17-64"	.265625
3	10.	1-4"	.25
4	9.375	15-64"	.234375
5	8.75	7-32"	.21875
6	8.125	13-64"	.203125
7	7.5	3-16"	.1875
8	6.875	11-64"	.171875
9	6.25	5-32"	.15625
10	5.625	9-64"	.140625
11	5.	1-8"	.125
12	4.375	7-64"	.109375
13	3.75	3-32"	.09375
14	3.125	5-64"	.078125
15	2.8125	9-128"	.0703125
16	2.5	1-16"	.0625
17	2.25	9-160"	.05625
18	2	1-20"	.05
19	1.75	7-160"	.04375
20	1.50	3-80"	.0375
21	1.375	11-320"	.034375
22	1.25	1-32"	.03125
23	1.125	9-320"	.028125
24	1.	1-40"	.025
25	.875	7-320"	.021875
26	.75	3-160"	.01817
27	.6875	11-640"	.0176875
28	.625	1-64"	.015025
29	.5625	9-640"	.0145625
30	.5	1-80"	.0125

Table of Weights of Sheet Copper

Per Square Foot and thickness, per Stubb's Wire Gage

Stubb's Wire Gage No.	Thickness Decimal Parts of An Inch	Ounces per Sq. Foot	Sheets 24" x 48" Weight in Pounds	Sheets 30" x 60" Weight in Pounds	Sheets 36" x 72" Weight in Pounds	Sheets 48" x 72" Weight in Pounds
35	.005	4	2	3.12	4.5	6
33	.008	6	3	4.68	6.75	9
31	.010	8	4	6.25	9.00	12
29	.013	10	5	7.81	11.25	15
27	.016	12	6	9.37	13.50	18
26	.018	14	7	10.93	15.75	21
24	.022	16	8	12.5	18.00	24
23	.025	18	9	14.06	20.25	27
22	.021	20	10	15.62	22.50	30
21	.032	24	12	18.75	27	36
19	.042	32	16	25.00	36	48
18	.049	40	20	31.25	45	60
16	.065	48	24	37.50	54	72
15	.072	56	28	43.75	63	84
14	.083	64	32	50	72	96
13	.095	70	35	55	79	105
12	.109	81	40½	63	91	122
11	.120	89	44½	70	100	134
10	.134	100	50	78	112	150
9	.148	110	55	86	124	165
8	.165	123	61	96	138	184
7	.180	134	67	105	151	201
6	.203	151	75½	118	170	227
5	.220	164	82	128	184	246
4	.238	177	88½	138	199	266
3	.259	193	96	151	217	289
2	.284	211	105½	165	238	317
1	.300	233	111½	174	251	335
0	.340	253	126½	198	285	380



Wire Gage Standards

Different Standards in Use in the United States

Dimensions of Sizes in Decimal Parts of an Inch

Number of Wire Gage	American or Brown & Sharpe	Birmingham or Stubbs' Iron Wire	Washburn and Moen Mfg. Co. Worcester, Mass.	Imperial Wire Gage	Stubbs' Steel Wire	U. S. Standard for Plate	Number of Wire Gage
000000	.....	.....	.....	.464	.....	.46875	000000
00000	.....	.....	.....	.432	.....	.4375	00000
0000	.46	.454	.3938	.400	.....	.40625	0000
000	.40964	.425	.3625	.372	.....	.375	000
00	.3648	.38	.3310	.348	.....	.34375	00
0	.32486	.34	.3065	.324	.....	.3125	0
1	.2893	.3	.2830	.300	.227	.28125	1
2	.25763	.284	.2625	.276	.219	.265625	2
3	.22942	.259	.2437	.252	.212	.25	3
4	.20431	.238	.2253	.232	.207	.234375	4
5	.18194	.22	.2070	.212	.204	.21875	5
6	.16202	.203	.1920	.192	.201	.203125	6
7	.14428	.18	.1770	.176	.199	.1875	7
8	.12849	.165	.1620	.160	.197	.171875	8
9	.11443	.148	.1483	.144	.194	.15625	9
10	.10189	.134	.1350	.128	.191	.140625	10
11	.090742	.12	.1205	.116	.188	.125	11
12	.080808	.109	.1055	.104	.185	.109375	12
13	.071961	.095	.0915	.092	.182	.09375	13
14	.064084	.083	.0800	.080	.180	.078125	14
15	.057068	.072	.0720	.072	.178	.0703125	15
16	.05082	.065	.0625	.064	.175	.0625	16
17	.045257	.058	.0540	.056	.172	.05625	17
18	.040303	.049	.0475	.048	.168	.05	18
19	.03589	.042	.0410	.040	.164	.04375	19
20	.031961	.035	.0348	.036	.161	.0375	20
21	.028462	.032	.03175	.032	.157	.034375	21
22	.025347	.028	.0286	.028	.155	.03125	22
23	.022571	.025	.0258	.024	.153	.028125	23
24	.0201	.022	.0230	.022	.151	.025	24
25	.0179	.02	.0204	.020	.148	.021875	25
26	.01594	.018	.0181	.018	.146	.01875	26
27	.014195	.016	.0173	.0164	.143	.0171875	27
28	.012641	.014	.0162	.0149	.139	.015625	28
29	.011257	.013	.0150	.0136	.134	.0140625	29
30	.010025	.012	.0140	.0124	.127	.0125	30
31	.008928	.01	.0132	.0116	.120	.0109375	31
32	.00795	.009	.0128	.0108	.115	.01015625	32
33	.00708	.008	.0118	.0100	.112	.009375	33
34	.006304	.007	.0104	.0092	.110	.00859375	34
35	.005614	.005	.0095	.0084	.108	.0078125	35
36	.005	.004	.0090	.0076	.106	.00703125	36
37	.004453	.....	.....	.0068	.103	.006640625	37
38	.003965	.....	.....	.0060	.101	.00625	38
39	.003531	.....	.....	.0052	.099	.....	39
40	.003144	.....	.....	.0048	.097	.....	40

Copper Wire Table

Of the American Institute of Electrical Engineers
(Condensed. Calculated for temperature of 20 deg. cent.)

Gage B & S	Area, Circular mils.	Weight lb. per 1000 ft.	Length ft. per ohm.	Resistance ohms per 1000 ft.	Gage B & S
0000	211,600.0	640.5	20440.0	0.04893	0000
000	167,800.0	508.0	16210.0	0.06170	000
00	133,100.0	402.8	12850.0	0.07780	00
0	105,500.0	319.5	10190.0	0.09811	0
1	83,690.0	253.3	8083.0	0.1237	1
2	66,370.0	200.9	6410.0	0.1560	2
3	52,630.0	159.3	5084.0	0.1967	3
4	41,740.0	126.4	4031.0	0.2480	4
5	33,100.0	100.2	3197.0	0.3128	5
6	26,250.0	79.46	2535.0	0.3944	6
7	20,820.0	63.02	2011.0	0.4973	7
8	16,510.0	49.98	1595.0	0.6271	8
9	13,090.0	39.63	1265.0	0.7908	9
10	10,380.0	31.43	1003.0	0.9972	10
11	8,234.0	24.93	795.3	1.257	11
12	6,530.0	19.77	630.7	1.586	12
13	5,178.0	15.68	500.1	1.999	13
14	4,107.0	12.43	396.6	2.521	14
15	3,257.0	9.858	314.5	3.179	15
16	2,583.0	7.818	249.4	4.009	16
17	2,048.0	6.200	197.8	5.055	17
18	1,624.0	4.917	156.9	6.374	18
19	1,288.0	3.899	124.4	8.038	19
20	1,022.0	3.092	98.66	10.14	20
21	810.1	2.452	78.24	12.78	21
22	642.4	1.945	62.05	16.12	22
23	509.5	1.542	49.21	20.32	23
24	404.0	1.223	39.02	25.63	24
25	320.4	0.9699	30.95	32.31	25
26	254.1	0.7692	24.54	40.75	26
27	201.5	0.6100	19.46	51.38	27
28	159.8	0.4837	15.43	64.79	28
29	126.7	0.3836	12.24	81.7	29
30	100.5	0.3042	9.707	103.0	30
31	79.7	0.2413	7.698	129.9	31
32	63.21	0.1913	6.105	163.8	32
33	50.13	0.1517	4.841	206.6	33
34	39.75	0.1203	3.839	260.5	34
35	31.52	0.09543	3.045	328.4	35
36	25.0	0.07568	2.414	414.2	36
37	19.83	0.06001	1.915	522.2	37
38	15.72	0.04759	1.519	658.5	38
39	12.47	0.03774	1.204	830.4	39
40	9.888	0.02993	0.955	1047.0	40

*For resistance at 0 deg. cent., multiply values by 0.9262;
at 50 deg. cent., by 1.11723; and at 80 deg. cent. by 1.23815.
(From M. E. Handbook.)

Conduit Sizes to be Used With Different Sizes Wires and Cables

Allowance has been made in the table for the easy pulling of wires around three elbows, so that in straight, short runs conduits a size smaller may be used, excepting that $\frac{1}{2}$ in. is the smallest size permitted by the underwriter's rules.

B & S Gage No.	Area, Circular mils	Amperes Rubber Insulation	Size of Pipe, Inches			Area, Circular mils	Amperes Rubber Insulation	Size of Pipe, Inches		
			1 Wire	2 Wire	3 Wire			1 Wire	2 Wire	3 Wire
18	1,020	3	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	500,000	390	2	3	$3\frac{1}{2}$
16	2,583	6	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	550,000	420	2	$3\frac{1}{2}$	4
14	4,107	12	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	600,000	450	2	$3\frac{1}{2}$	4
12	6,530	17	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	650,000	475	2	$3\frac{1}{2}$	4
10	10,380	24	$\frac{1}{2}$	$\frac{3}{4}$	1	700,000	500	2	$3\frac{1}{2}$	4
8	16,510	33	$\frac{1}{2}$	1	1	750,000	525	2	$3\frac{1}{2}$	4
6	26,250	46	$\frac{3}{4}$	1	$1\frac{1}{4}$	800,000	550	2	$3\frac{1}{2}$	4
5	33,100	54	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	850,000	575	$2\frac{1}{2}$	4	4
4	41,740	65	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	900,000	600	$2\frac{1}{2}$	4	$4\frac{1}{2}$
3	52,630	76	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	950,000	625	$2\frac{1}{2}$	4	$4\frac{1}{2}$
2	66,370	90	$\frac{3}{4}$	$1\frac{1}{2}$	2	1,000,000	650	$2\frac{1}{2}$	4	$4\frac{1}{2}$
1	83,690	107	1	$1\frac{1}{2}$	2	1,100,000	690	$2\frac{1}{2}$	4	5
0	105,500	127	1	2	2	1,200,000	730	$2\frac{1}{2}$	$4\frac{1}{2}$	5
00	133,100	150	1	2	2	1,300,000	770	$2\frac{1}{2}$	$4\frac{1}{2}$	6
000	167,800	177	$1\frac{1}{4}$	2	$2\frac{1}{2}$	1,400,000	810	3	5	6
0000	211,600	210	$1\frac{1}{4}$	2	$2\frac{1}{2}$	1,500,000	850	3	5	6
	200,000	200	$1\frac{1}{4}$	2	$2\frac{1}{2}$	1,600,000	890	3	5	6
	250,000	235	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	1,700,000	930	3	6	7
	300,000	270	$1\frac{1}{2}$	$2\frac{1}{2}$	3	1,800,000	970	3	6	7
	350,000	300	$1\frac{1}{2}$	$2\frac{1}{2}$	3	1,900,000	1,010	3	6	7
	400,000	330	$1\frac{1}{2}$	3	$3\frac{1}{2}$	2,000,000	1,050	3	6	7
	450,000	380	2	3	$3\frac{1}{2}$			3	6	



Table of Cutting Speeds (Drills—see page 247)
Feet per Minute

Diam. Inches	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	REVOLUTIONS PER MINUTE														
$\frac{1}{16}$	1834	2140	2445	2751	3057	3363	3668	3974	4280	4586	4891	5197	5502	5808	6114
$\frac{1}{8}$	917	1070	1222	1375	1528	1681	1834	1986	2139	2292	2445	2598	2750	2903	3056
$\frac{3}{16}$	611	713	815	917	1019	1121	1222	1325	1426	1529	1630	1732	1836	1936	2038
$\frac{1}{4}$	458	535	611	688	764	841	917	994	1070	1147	1222	1300	1376	1453	1528
$\frac{5}{16}$	367	428	489	550	611	672	733	794	856	917	978	1039	1100	1161	1222
$\frac{3}{8}$	306	357	408	458	509	560	611	662	713	764	815	865	916	967	1018
$\frac{7}{16}$	262	306	349	393	437	481	524	568	611	656	699	743	786	830	874
$\frac{1}{2}$	229	268	306	344	382	420	459	497	535	573	611	649	688	726	764
$\frac{9}{16}$	204	238	272	306	340	373	407	441	475	509	543	577	611	645	679
$\frac{5}{8}$	184	214	245	276	306	337	367	398	428	459	489	520	552	581	612
$\frac{11}{16}$	167	194	222	249	273	300	333	360	389	416	444	472	500	527	555
$\frac{3}{4}$	153	178	203	229	254	279	306	330	357	381	408	433	458	483	508
$\frac{13}{16}$	142	166	190	213	237	261	284	308	332	356	379	403	427	450	474
$\frac{7}{8}$	131	153	175	196	219	241	262	285	306	329	349	372	392	416	438
$1\frac{1}{16}$	122	142	163	183	204	224	244	265	285	305	326	346	366	387	407
1	115	134	153	172	191	210	229	258	267	287	306	325	344	363	382
$1\frac{1}{8}$	108	126	144	162	180	197	215	233	251	269	287	305	323	341	359
$1\frac{1}{4}$	102	119	136	153	170	187	204	221	238	255	272	289	306	324	340
$1\frac{3}{8}$	97	113	129	145	161	177	193	209	225	242	258	274	290	306	322
$1\frac{1}{2}$	92	107	123	137	153	168	183	199	214	230	245	260	274	291	306
$1\frac{5}{8}$	87	102	116	131	146	160	175	189	204	218	233	247	262	276	291
$1\frac{3}{4}$	83	97	111	125	139	153	167	180	195	208	222	236	250	264	278
$1\frac{7}{8}$	80	93	106	119	133	146	159	172	186	199	212	225	239	252	265
2	76	89	102	115	127	140	153	165	178	191	204	216	230	241	254
$2\frac{1}{8}$	73	85	98	110	122	134	146	159	171	183	195	207	220	232	244
$2\frac{1}{4}$	71	82	94	106	117	129	141	152	165	176	188	199	212	222	234
$2\frac{3}{8}$	68	79	90	102	113	124	136	147	158	170	181	192	203	215	226
$2\frac{1}{2}$	66	76	87	98	109	120	131	142	153	164	175	185	196	207	218
$2\frac{5}{8}$	63	74	84	95	106	116	127	137	148	158	169	179	190	200	211
$2\frac{3}{4}$	61	71	82	92	102	112	122	133	143	153	163	173	184	194	204
$2\frac{7}{8}$	59	69	79	89	99	108	118	128	138	148	158	167	177	187	197
3	57	67	76	86	96	105	115	124	134	143	153	162	172	181	191

Squares, Cubes, Square and Cube Roots of Nos. from 1 to 100

No.	Sq.	Cube	Sq. Root	Cube Root	No.	Sq.	Cube	Sq. Root	Cube Root
1	1	1	1.0000	1.0000	51	2601	132651	7.1414	3.7084
2	4	8	1.4142	1.2599	52	2704	140608	7.2111	3.7325
3	9	27	1.7321	1.4422	53	2809	148877	7.2801	3.7563
4	16	64	2.0000	1.5874	54	2916	157464	7.3485	3.7798
5	25	125	2.2361	1.7100	55	3025	166375	7.4162	3.8030
6	36	216	2.4495	1.8171	56	3136	175616	7.4833	3.8259
7	49	343	2.6458	1.9129	57	3249	185193	7.5498	3.8485
8	64	512	2.8284	2.0000	58	3364	195112	7.6158	3.8709
9	81	729	3.0000	2.0801	59	3481	205379	7.6811	3.8930
10	100	1000	3.1623	2.1544	60	3600	216000	7.7460	3.9149
11	121	1331	3.3166	2.2240	61	3721	226981	7.8102	3.9365
12	144	1728	3.4641	2.2894	62	3844	238328	7.8740	3.9579
13	169	2197	3.6056	2.3513	63	3969	250047	7.9373	3.9791
14	196	2744	3.7417	2.4101	64	4096	262144	8.0000	4.0000
15	225	3375	3.8730	2.4662	65	4225	274625	8.0623	4.0207
16	256	4096	4.0000	2.5198	66	4356	287496	8.1240	4.0412
17	289	4913	4.1231	2.5713	67	4489	300763	8.1854	4.0615
18	324	5832	4.2426	2.6207	68	4624	314432	8.2462	4.0817
19	361	6859	4.3589	2.6684	69	4761	328509	8.3066	4.1016
20	400	8000	4.4721	2.7144	70	4900	343000	8.3666	4.1213
21	441	9261	4.5826	2.7589	71	5041	357911	8.4261	4.1408
22	484	10648	4.6904	2.8020	72	5184	373248	8.4853	4.1602
23	529	12167	4.7958	2.8439	73	5329	389017	8.5440	4.1793
24	576	13824	4.8990	2.8845	74	5476	405224	8.6023	4.1983
25	625	15625	5.0000	2.9240	75	5625	421875	8.6603	4.2172
26	676	17576	5.0990	2.9625	76	5776	438976	8.7178	4.2358
27	729	19683	5.1962	3.0000	77	5929	456533	8.7750	4.2543
28	784	21952	5.2915	3.0366	78	6084	474552	8.8318	4.2727
29	841	24389	5.3852	3.0723	79	6241	493039	8.8882	4.2908
30	900	27000	5.4772	3.1072	80	6400	512000	8.9443	4.3089
31	961	29791	5.5678	3.1414	81	6561	531441	9.0000	4.3267
32	1024	32768	5.6569	3.1748	82	6724	551368	9.0554	4.3445
33	1089	35937	5.7446	3.2075	83	6889	571787	9.1104	4.3621
34	1156	39304	5.8310	3.2396	84	7056	592704	9.1652	4.3795
35	1225	42875	5.9161	3.2711	85	7225	614125	9.2195	4.3968
36	1296	46656	6.0000	3.3019	86	7396	636056	9.2736	4.4140
37	1369	50653	6.0828	3.3322	87	7569	658503	9.3276	4.4310
38	1444	54872	6.1644	3.3620	88	7744	681472	9.3808	4.4480
39	1521	59319	6.2450	3.3912	89	7921	704969	9.4340	4.4647
40	1600	64000	6.3246	3.4200	90	8100	729000	9.4868	4.4814
41	1681	68921	6.4031	3.4482	91	8281	753571	9.5394	4.4979
42	1764	74088	6.4807	3.4760	92	8464	778688	9.5917	4.5144
43	1849	79507	6.5574	3.5034	93	8649	804357	9.6437	4.5307
44	1936	85184	6.6332	3.5303	94	8836	830584	9.6954	4.5468
45	2025	91125	6.7082	3.5569	95	9025	857375	9.7468	4.5629
46	2116	97336	6.7823	3.5830	96	9216	884736	9.7980	4.5789
47	2209	103823	6.8557	3.6088	97	9409	912673	9.8489	4.5947
48	2304	110592	6.9282	3.6342	98	9604	941191	9.8995	4.6104
49	2401	117649	7.0000	3.6593	99	9801	970299	9.9499	4.6261
50	2500	125000	7.0711	3.6840	100	10000	1000000	10.0000	4.6416



Circumferences and Areas of Circles

Diam.	Circumference	Area	Diam.	Circumference	Area	Diam.	Circumference	Area
$\frac{1}{16}$	0.1964	0.0031	$13\frac{1}{2}$	42.4115	143.14	52	163.363	2123.7
$\frac{1}{8}$	0.3927	0.0123	14	43.9823	153.94	53	166.504	2206.2
$\frac{3}{16}$	0.5890	0.0276	$\frac{1}{2}$	45.5331	165.13	54	169.646	2290.2
$\frac{1}{4}$	0.7854	0.0491	15	47.1239	176.71	55	172.788	2375.8
$\frac{5}{16}$	0.9817	0.0767	$\frac{1}{2}$	48.6947	188.69	56	175.929	2463.0
$\frac{3}{8}$	1.1781	0.1105	16	50.2655	201.06	57	179.071	2551.8
$\frac{7}{16}$	1.3745	0.1503	$\frac{1}{2}$	51.8363	213.82	58	182.212	2642.1
$\frac{1}{2}$	1.5708	0.1964	17	53.4071	226.98	59	185.354	2734.0
$\frac{9}{16}$	1.7672	0.2485	$\frac{1}{2}$	54.9779	240.53	60	188.496	2827.4
$\frac{5}{8}$	1.9635	0.3068	18	56.5487	254.47	61	191.637	2922.5
$\frac{11}{16}$	2.1598	0.3712	$\frac{1}{2}$	58.1195	268.80	62	194.779	3019.1
$\frac{3}{4}$	2.3562	0.4418	19	59.6903	283.53	63	197.920	3117.2
$\frac{13}{16}$	2.5525	0.5185	$\frac{1}{2}$	61.2611	298.65	64	201.062	3217.0
$\frac{7}{8}$	2.7489	0.6013	20	62.8319	314.16	65	204.204	3318.3
$1\frac{1}{16}$	2.9452	0.6903	$\frac{1}{2}$	64.4026	330.06	66	207.345	3421.2
1	3.1416	0.7854	21	65.9734	346.36	67	210.487	3525.7
$\frac{1}{8}$	3.5343	0.9940	$\frac{1}{2}$	67.5442	363.05	68	213.628	3631.7
$\frac{1}{4}$	3.9270	1.2272	22	69.1150	380.13	69	216.770	3739.3
$\frac{3}{8}$	4.3197	1.4849	$\frac{1}{2}$	70.6858	397.61	70	219.911	3848.5
$\frac{1}{2}$	4.7124	1.7671	23	72.2566	415.48	71	223.053	3959.2
$\frac{5}{8}$	5.1051	2.0739	$\frac{1}{2}$	73.8274	433.74	72	226.195	4071.5
$\frac{3}{4}$	5.4978	2.4053	24	75.3982	452.39	73	229.336	4185.4
$\frac{7}{8}$	5.8905	2.7612	$\frac{1}{2}$	76.9690	471.44	74	232.478	4300.8
2	6.2832	3.1416	25	78.5398	490.87	75	235.619	4417.9
$\frac{1}{4}$	7.0686	3.9761	26	81.6814	530.93	76	238.761	4536.5
$\frac{1}{2}$	7.8540	4.9087	27	84.8230	572.56	77	241.903	4656.6
$\frac{3}{4}$	8.6394	5.9396	28	87.9646	615.75	78	245.044	4778.4
3	9.4248	7.0686	29	91.1062	660.52	79	248.186	4901.7
$\frac{1}{4}$	10.2102	8.2958	30	94.2478	706.86	80	251.327	5026.5
$\frac{1}{2}$	10.9956	9.6211	31	97.3894	754.77	81	254.469	5153.0
$\frac{3}{4}$	11.7810	11.045	32	100.531	804.25	82	257.611	5281.0
4	12.5664	12.566	33	103.673	855.30	83	260.752	5410.6
$\frac{1}{2}$	14.1372	15.904	34	106.814	907.92	84	263.894	5541.8
5	15.7080	19.635	35	109.956	962.11	85	267.035	5674.5
$\frac{1}{2}$	17.2788	23.758	36	113.097	1017.9	86	270.177	5808.8
6	18.8496	28.274	37	116.239	1075.2	87	273.319	5944.7
$\frac{1}{2}$	20.4204	33.183	38	119.381	1134.1	88	276.460	6082.1
7	21.9911	38.485	39	122.522	1194.6	89	279.602	6221.1
$\frac{1}{2}$	23.5619	44.179	40	125.664	1256.6	90	282.743	6361.7
8	25.1327	50.265	41	128.805	1320.3	91	285.885	6503.9
$\frac{1}{2}$	26.7035	56.745	42	131.947	1385.4	92	289.027	6647.6
9	28.2743	63.617	43	135.088	1452.2	93	292.168	6792.9
$\frac{1}{2}$	29.8451	70.882	44	138.230	1520.5	94	295.310	6939.8
10	31.4159	78.540	45	141.372	1590.4	95	298.451	7088.2
$\frac{1}{2}$	32.9867	86.590	46	144.513	1661.9	96	301.593	7238.2
11	34.5575	95.033	47	147.655	1734.9	97	304.734	7389.8
$\frac{1}{2}$	36.1283	103.87	48	150.796	1809.6	98	307.876	7543.0
12	37.6991	113.10	49	153.938	1885.7	99	311.018	7697.7
$\frac{1}{2}$	39.2699	122.72	50	157.080	1963.5	100	314.16	7854.0
13	40.8407	132.73	51	160.221	2042.8			



Reciprocals of Numbers

From 1 to 200

No.	Reciprocal	No.	Reciprocal	No.	Reciprocal	No.	Reciprocal
1	1.00000000	51	.01960784	101	.00990099	151	.00662252
2	.50000000	52	.01923077	102	.00980392	152	.00657895
3	.33333333	53	.01886792	103	.00970874	153	.00653595
4	.25000000	54	.01851852	104	.00961538	154	.00649351
5	.20000000	55	.01818182	105	.00952381	155	.00645161
6	.16666667	56	.01785714	106	.00943396	156	.00641026
7	.14285714	57	.01754386	107	.00934579	157	.00636943
8	.12500000	58	.01724138	108	.00925926	158	.00632911
9	.11111111	59	.01694915	109	.00917431	159	.00628931
10	.10000000	60	.01666667	110	.00909091	160	.00625000
11	.09090909	61	.01639344	111	.00900901	161	.00621118
12	.08333333	62	.01612903	112	.00892857	162	.00617284
13	.07692308	63	.01587302	113	.00884956	163	.00613497
14	.07142857	64	.01562500	114	.00877193	164	.00609756
15	.06666667	65	.01538461	115	.00869565	165	.00606061
16	.06250000	66	.01515151	116	.00862069	166	.00602410
17	.05882353	67	.01492537	117	.00854701	167	.00595238
18	.05555556	68	.01470588	118	.00847458	168	.00595238
19	.05263158	69	.01449275	119	.00840336	169	.00591716
20	.05000000	70	.01428571	120	.00833333	170	.00588235
21	.04761905	71	.01408451	121	.00826446	171	.00584795
22	.04545455	72	.01388889	122	.00819672	172	.00581395
23	.04347826	73	.01369863	123	.00813008	173	.00578035
24	.04166667	74	.01351351	124	.00806452	174	.00574713
25	.04000000	75	.01333333	125	.00800000	175	.00571429
26	.03846154	76	.01315789	126	.00793651	176	.00568182
27	.03703704	77	.01298701	127	.00787402	177	.00564972
28	.03571429	78	.01282051	128	.00781250	178	.00561798
29	.03448276	79	.01265823	129	.00775194	179	.00558659
30	.03333333	80	.01250000	130	.00769231	180	.00555556
31	.03225806	81	.01234568	131	.00763359	181	.00552486
32	.03125000	82	.01219512	132	.00757576	182	.00549451
33	.03030303	83	.01204819	133	.00751880	183	.00546448
34	.02941176	84	.01190476	134	.00746269	184	.00543478
35	.02857143	85	.01176471	135	.00740741	185	.00540540
36	.02777778	86	.01162791	136	.00735294	186	.00537634
37	.02702703	87	.01149425	137	.00729927	187	.00534759
38	.02631579	88	.01136364	138	.00724638	188	.00531914
39	.02564103	89	.01123595	139	.00719424	189	.00529100
40	.02500000	90	.01111111	140	.00714286	190	.00526316
41	.02439024	91	.01098901	141	.00709220	191	.00523560
42	.02380952	92	.01086956	142	.00704225	192	.00520833
43	.02325581	93	.01075269	143	.00699301	193	.00518135
44	.02272727	94	.01063830	144	.00694444	194	.00515464
45	.02222222	95	.01052632	145	.00689655	195	.00512820
46	.02173913	96	.01041667	146	.00684931	196	.00510204
47	.02127660	97	.01030928	147	.00680272	197	.00507614
48	.02083333	98	.01020408	148	.00675676	198	.00505051
49	.02040816	99	.01010101	149	.00671141	199	.00502513
50	.02000000	100	.01000000	150	.00666667	200	.00500000

Decimal Equivalents of Fractions of an Inch

$\frac{1}{64}$ 0.015 625	$\frac{11}{32}$ 0.343 75	$\frac{43}{64}$ 0.671 875
$\frac{1}{32}$ 0.031 25	$\frac{23}{64}$ 0.359 375	$\frac{11}{16}$ 0.687 5
$\frac{3}{64}$ 0.046 875	$\frac{3}{8}$ 0.375	$\frac{45}{64}$ 0.703 125
$\frac{1}{16}$ 0.062 5	$\frac{25}{64}$ 0.390 625	$\frac{23}{32}$ 0.718 75
$\frac{5}{64}$ 0.078 125	$\frac{13}{32}$ 0.406 25	$\frac{47}{64}$ 0.734 375
$\frac{3}{32}$ 0.093 75	$\frac{27}{64}$ 0.421 875	$\frac{3}{4}$ 0.750
$\frac{7}{64}$ 0.109 375	$\frac{7}{16}$ 0.437 5	$\frac{49}{64}$ 0.765 625
$\frac{1}{8}$ 0.125	$\frac{29}{64}$ 0.453 125	$\frac{25}{32}$ 0.781 25
$\frac{9}{64}$ 0.140 625	$\frac{15}{32}$ 0.468 75	$\frac{51}{64}$ 0.796 875
$\frac{5}{32}$ 0.156 25	$\frac{31}{64}$ 0.484 375	$\frac{13}{16}$ 0.812 5
$\frac{11}{64}$ 0.171 875	$\frac{1}{2}$ 0.500	$\frac{53}{64}$ 0.828 125
$\frac{3}{16}$ 0.187 5	$\frac{33}{64}$ 0.515 625	$\frac{27}{32}$ 0.843 75
$\frac{13}{64}$ 0.203 125	$\frac{17}{32}$ 0.531 25	$\frac{55}{64}$ 0.859 375
$\frac{7}{32}$ 0.218 75	$\frac{35}{64}$ 0.546 875	$\frac{7}{8}$ 0.875
$\frac{15}{64}$ 0.234 375	$\frac{9}{16}$ 0.562 5	$\frac{57}{64}$ 0.890 625
$\frac{1}{4}$ 0.250	$\frac{37}{64}$ 0.578 125	$\frac{29}{32}$ 0.906 25
$\frac{17}{64}$ 0.265 625	$\frac{19}{32}$ 0.593 75	$\frac{59}{64}$ 0.921 875
$\frac{9}{32}$ 0.281 25	$\frac{39}{64}$ 0.609 375	$\frac{15}{16}$ 0.937 5
$\frac{19}{64}$ 0.296 875	$\frac{5}{8}$ 0.625	$\frac{61}{64}$ 0.953 125
$\frac{5}{16}$ 0.312 5	$\frac{41}{64}$ 0.640 625	$\frac{31}{32}$ 0.968 75
$\frac{21}{64}$ 0.328 125	$\frac{21}{32}$ 0.656 25	$\frac{63}{64}$ 0.984 375

Equivalents of Various Measures and Weights

	U. S. Gallon	Imperial Gallon	Cubic In.	Cubic Ft.	Pound	Cwt.	Ton	Liter	Cubic Meter
U. S. Gallon	1.	.83	231.	.133	8.33	.0746	.0037	3.8	.0038
Imperial Gal.	1.2	1.	277.274	.16	10.	.0892	.0045	4.537	.0045
Cubic Inch	.0043	.0036	1.	.0006	.0361	.....	.....	.0163	.....
Cubic Foot	7.48	6.23	1728.	1.	62.35	.557	.028	28.375	.0283
Pound	.083	.10	27.72	.016	1.	112.	2240.	.....	.....
Cwt.	13.44	11.2	.....	1.8	.....	1.	20.	.....	.....
Ton	268.8	224.	.....	35.9	.....	.05	1.	1000.	1.
Liter	.264	.22	61.	.0353	.....	.....	.001	1.	.001
Cubic Meter	264.	220.	61028.	35.31	.....	.....	1.	1000.	1.



The Metric System

The Metric System is based on the Meter which was designed to be one ten-millionth (1-10,000,000) part of the earth's meridian, passing through Dunkirk and Formenteral. Later investigations, however, have shown that the Meter exceeds one ten-millionth part by almost one part in 6400. The value of the Meter as authorized by the United States Government, is 39.37 inches. The Metric system was legalized by the United States Government in 1866.

The three principal units are the Meter, the unit of length; the Liter, the unit of capacity; and the Gram, the unit of weight. Multiples of these are obtained by prefixing the Greek words: deka (10), hekto (100), and kilo (1000). Divisions are obtained by prefixing the Latin words: deci (1-10), centi (1-100), and milli (1-1000). Abbreviations of the multiples begin with a capital letter, and of the divisions with a small letter, as in the following tables:

MEASURES OF LENGTH

10 millimeters (mm.)	= 1 centimeter	cm.
10 centimeters	= 1 decimeter	dm.
10 decimeters	= 1 meter	m.
10 meters	= 1 dekameter	Dm.
10 dekameters	= 1 hektometer	Hm.
10 hektometers	= 1 kilometer	Km.

MEASURES OF SURFACE (NOT LAND)

100 square millimeters (mm. ²)	= 1 square centimeter	cm. ²
100 square centimeters	= 1 square decimeter	dm. ²
100 square decimeters	= 1 square meter	m. ²

MEASURES OF VOLUME

1000 cubic millimeters (mm. ³)	= 1 cubic centimeter	cm. ³
1000 cubic centimeters	= 1 cubic decimeter	dm. ³
1000 cubic decimeters	= 1 cubic meter	m. ³

MEASURES OF CAPACITY

10 milliliters (ml.)	= 1 centiliter	cl.
10 centiliters	= 1 deciliter	dl.
10 deciliters	= 1 liter	l.
10 liters	= 1 dekaliter	Dl.
10 dekaliters	= 1 hektoliter	Hl.
10 hektoliters	= 1 kiloliter	Kl.

Note:—The liter is equal to the volume occupied by 1 cubic decimeter.

MEASURES OF WEIGHT

10 milligrams (mg.)	= 1 centigram	cg.
10 centigrams	= 1 decigram	dg.
10 decigrams	= 1 gram	g.
10 grams	= 1 dekagram	Dg.
10 dekagrams	= 1 hektogram	Hg.
10 hektograms	= 1 kilogram	Kg.
1000 kilograms	= 1 ton	T.

Note:—The gram is the weight of one cubic centimeter of pure distilled water at a temperature of 39.2° F.; the kilogram is the weight of 1 liter of water; the ton is the weight of 1 cubic meter of water.

Metric and English or American (U.S.) Equivalent Measures

MEASURES OF LENGTH

1 meter = { 39.37 inches 3.28083 feet 1.0936 yards	1 foot = .3048 meter
1 centimeter = .3937 inch	1 inch = { 2.54 centimeters 25.4 millimeters
1 millimeter = { .03937 inch, or 1/25 inch nearly	
1 kilometer = 0.62137 mile	

MEASURES OF SURFACE

1 square meter = { 10.764 square feet 1.196 square yards	1 square yard = .836 square meter
1 square centimeter = .155 square inch	1 square foot = .0929 square meter
1 square millimeter = .00155 square inch	1 square inch = { 6.452 sq. centimeters 645.2 sq. millimeters

MEASURES OF VOLUME AND CAPACITY

1 cubic meter = { 35.314 cubic feet 1.308 cubic yards 264.2 gallons (231 cubic inch)	1 cubic yard = .7645 cubic meter
1 cubic decimeter = { 61.023 cubic inch .0353 cubic foot	1 cubic foot = { .02832 cubic meter 28.317 cubic decimeters 28.317 liters
1 cubic centimeter = .061 cubic inch	
{ 1 cubic decimeter 61.023 cubic inches	1 cubic inch = 16.393 cubic centimeters
1 liter = { .0353 cubic foot 1.0567 quarts (U. S.) .2642 gallon (U. S.) 2.202 lbs. of water at 62° F.	1 gallon (British) = 4.543 liters 1 gallon (U. S.) = 3.785 liters

MEASURES OF WEIGHT

1 gram = 15.432 grains	1 grain = .0648 gram
1 kilogram = 2.2046 pounds	1 ounce avoirdupois = 28.35 grams
{ .9842 ton of 2240 lbs.	1 pound = 4536 kilogram
1 metric ton = { 19.68 cwts. 2204.6 lbs.	1 ton of 2240 lbs. = { 1.016 metric ton 1016 kilograms

MISCELLANEOUS

1 kilogram per meter = 6720 pounds per foot.	
1 gram per square millimeter = 1.422 pounds per square inch.	
1 kilogram per square meter = 0.2048 pounds per square foot.	
1 kilogram per cubic meter = .0624 pounds per cubic foot.	
1 degree centigrade = 1.8 degrees Fahrenheit.	
1 pound per foot = 1.488 kilograms per meter.	
1 pound per square foot = 4.882 kilograms per square meter.	
1 pound per cubic foot = 16.02 kilograms per cubic meter.	
1 degree Fahrenheit = .5556 degrees centigrade.	
1 Caloric (French Thermal Unit) = 3.968 B. T. U. (British Thermal Unit.)	
1 Horse Power { 33,000 foot pounds per minute. 746 Watts.	
1 Watt (Unit of Electrical Power) = { .00134 Horse Power. 44.22 foot pounds per minute.	
1 Kilowatt { 1000 Watts. 1.34 Horse Power. 44220 foot pounds per minute.	



Decimals of Millimeters and Equivalent Decimals of Inches

(Advancing by .01 mm)

mm.	Inches	mm.	Inches	mm.	Inches	mm.	Inches
.01	.00039	.26	.01024	.51	.02008	.76	.02992
.02	.00079	.27	.01063	.52	.02047	.77	.03032
.03	.00118	.28	.01102	.53	.02087	.78	.03071
.04	.00157	.29	.01142	.54	.02126	.79	.03110
.05	.00197	.30	.01181	.55	.02165	.80	.03150
.06	.00236	.31	.01220	.56	.02205	.81	.03189
.07	.00276	.32	.01260	.57	.02244	.82	.03228
.08	.00315	.33	.01299	.58	.02283	.83	.03268
.09	.00354	.34	.01339	.59	.02323	.84	.03307
.10	.00394	.35	.01378	.60	.02362	.85	.03346
.11	.00433	.36	.01417	.61	.02402	.86	.03386
.12	.00472	.37	.01457	.62	.02441	.87	.03425
.13	.00512	.38	.01496	.63	.02480	.88	.03465
.14	.00551	.39	.01535	.64	.02520	.89	.03504
.15	.00591	.40	.01575	.65	.02559	.90	.03543
.16	.00630	.41	.01614	.66	.02598	.91	.03583
.17	.00669	.42	.01654	.67	.02638	.92	.03622
.18	.00709	.43	.01693	.68	.02677	.93	.03661
.19	.00748	.44	.01732	.69	.02717	.94	.03701
.20	.00787	.45	.01772	.70	.02756	.95	.03740
.21	.00827	.46	.01811	.71	.02795	.96	.03780
.22	.00866	.47	.01850	.72	.02835	.97	.03819
.23	.00906	.48	.01890	.73	.02874	.98	.03858
.24	.00945	.49	.01929	.74	.02913	.99	.03898
.25	.00984	.50	.01969	.75	.02953	1.00	.03937

Millimeters and Equivalent Decimals of Inches

(Advancing by 1 mm.)

mm.	Inches	mm.	Inches	mm.	Inches	mm.	Inches
1	.03937	26	1.02362	51	2.00787	76	2.99212
2	.07874	27	1.06299	52	2.04724	77	3.03149
3	.11811	28	1.10236	53	2.08661	78	3.07086
4	.15748	29	1.14173	54	2.12598	79	3.11023
5	.19685	30	1.18110	55	2.16535	80	3.14960
6	.23622	31	1.22047	56	2.20472	81	3.18897
7	.27559	32	1.25984	57	2.24409	82	3.22834
8	.31496	33	1.29921	58	2.28346	83	3.26771
9	.35433	34	1.33858	59	2.32283	84	3.30708
10	.39370	35	1.37795	60	2.36220	85	3.34645
11	.43307	36	1.41732	61	2.40157	86	3.38582
12	.47244	37	1.45669	62	2.44094	87	3.42519
13	.51181	38	1.49606	63	2.48031	88	3.46456
14	.55118	39	1.53543	64	2.51968	89	3.50393
15	.59055	40	1.57480	65	2.55905	90	3.54330
16	.62992	41	1.61417	66	2.59842	91	3.58267
17	.66929	42	1.65354	67	2.63779	92	3.62204
18	.70866	43	1.69291	68	2.67716	93	3.66141
19	.74803	44	1.73228	69	2.71653	94	3.70078
20	.78740	45	1.77165	70	2.75590	95	3.74015
21	.82677	46	1.81102	71	2.79527	96	3.77952
22	.86614	47	1.85039	72	2.83464	97	3.81889
23	.90551	48	1.88976	73	2.87401	98	3.85826
24	.94488	49	1.92913	74	2.91338	99	3.89763
25	.98425	50	1.96850	75	2.95275	100	3.93700



Weight per Foot

Of square and round bar iron weighing 480 pounds per cubic foot, in pounds per linear foot.

For carbon steel, add 2 per cent.

For high speed steel, add 15 per cent.

Thickness or Diam. in Inches	Weight of Bar One Foot Long		Thickness or Diam. in Inches	Weight of Bar One Foot Long		Thickness or Diam. in Inches	Weight of Bar One Foot Long	
	Square	Round		Square	Round		Square	Round
$\frac{1}{16}$	.013	.010	$\frac{7}{16}$	19.80	15.55	$\frac{3}{4}$	75.21	59.07
$\frac{1}{8}$	.052	.041	$\frac{1}{2}$	20.83	16.36	$\frac{13}{16}$	77.20	60.63
$\frac{3}{16}$	.117	.092	$\frac{9}{16}$	21.89	17.19	$\frac{7}{8}$	79.22	62.22
$\frac{1}{4}$	.208	.164	$\frac{5}{8}$	22.97	18.04	$\frac{15}{16}$	81.26	63.82
$\frac{5}{16}$	.326	.256	$\frac{11}{16}$	24.08	18.91	5	83.33	65.45
$\frac{3}{8}$	.469	.368	$\frac{3}{4}$	25.21	19.80	$\frac{1}{16}$	85.43	67.10
$\frac{7}{16}$	.638	.501	$\frac{13}{16}$	26.37	20.71	$\frac{1}{8}$	87.55	68.76
$\frac{1}{2}$	.833	.654	$\frac{7}{8}$	27.55	21.64	$\frac{3}{16}$	89.70	70.45
$\frac{9}{16}$	1.055	.828	$\frac{15}{16}$	28.76	22.59	$\frac{1}{4}$	91.88	72.16
$\frac{5}{8}$	1.302	1.023	3	30.00	23.56	$\frac{5}{16}$	94.08	73.89
$\frac{11}{16}$	1.576	1.237	$\frac{1}{16}$	31.26	24.55	$\frac{3}{8}$	96.30	75.64
$\frac{3}{4}$	1.875	1.473	$\frac{1}{8}$	32.55	25.57	$\frac{7}{16}$	98.55	77.40
$\frac{13}{16}$	2.201	1.728	$\frac{3}{16}$	33.87	26.60	$\frac{1}{2}$	100.8	79.19
$\frac{7}{8}$	2.552	2.004	$\frac{1}{4}$	35.21	27.65	$\frac{9}{16}$	103.1	81.00
$\frac{15}{16}$	2.930	2.301	$\frac{5}{16}$	36.58	28.73	$\frac{5}{8}$	105.5	82.83
1	3.333	2.618	$\frac{3}{8}$	37.97	29.82	$\frac{11}{16}$	107.8	84.69
$\frac{1}{16}$	3.763	2.955	$\frac{7}{16}$	39.39	30.94	$\frac{3}{4}$	110.2	86.56
$\frac{1}{8}$	4.219	3.313	$\frac{1}{2}$	40.83	32.07	$\frac{13}{16}$	112.6	88.45
$\frac{3}{16}$	4.701	3.692	$\frac{9}{16}$	42.30	33.23	$\frac{7}{8}$	115.1	90.36
$\frac{1}{4}$	5.208	4.091	$\frac{5}{8}$	43.80	34.40	$\frac{15}{16}$	117.5	92.29
$\frac{5}{16}$	5.742	4.510	$\frac{11}{16}$	45.33	35.60	6	120.0	94.25
$\frac{3}{8}$	6.302	4.950	$\frac{3}{4}$	46.88	36.82	$\frac{1}{8}$	125.1	98.22
$\frac{7}{16}$	6.888	5.410	$\frac{13}{16}$	48.45	38.05	$\frac{1}{4}$	130.2	102.3
$\frac{1}{2}$	7.500	5.890	$\frac{7}{8}$	50.05	39.31	$\frac{3}{8}$	135.5	106.4
$\frac{9}{16}$	8.138	6.392	$\frac{15}{16}$	51.68	40.59	$\frac{1}{2}$	140.8	110.6
$\frac{5}{8}$	8.802	6.913	4	53.33	41.89	$\frac{5}{8}$	146.3	114.9
$\frac{11}{16}$	9.942	7.455	$\frac{1}{16}$	55.01	43.21	$\frac{3}{4}$	151.9	119.3
$\frac{3}{4}$	10.21	8.018	$\frac{1}{8}$	56.72	44.55	$\frac{7}{8}$	157.6	123.7
$\frac{13}{16}$	10.95	8.601	$\frac{3}{16}$	58.45	45.91	7	163.3	128.3
$\frac{7}{8}$	11.72	9.204	$\frac{1}{4}$	60.21	47.29	$\frac{1}{8}$	169.2	132.9
$\frac{15}{16}$	12.51	9.828	$\frac{5}{16}$	61.99	48.69	$\frac{1}{4}$	175.2	137.6
2	13.33	10.47	$\frac{3}{8}$	63.80	50.11	$\frac{3}{8}$	181.3	142.4
$\frac{1}{16}$	14.18	11.14	$\frac{7}{16}$	65.64	51.55	$\frac{1}{2}$	187.5	147.3
$\frac{1}{8}$	15.05	11.82	$\frac{1}{2}$	67.50	53.01	$\frac{5}{8}$	193.8	152.2
$\frac{3}{16}$	15.95	12.53	$\frac{9}{16}$	69.39	54.50	$\frac{3}{4}$	200.2	157.2
$\frac{1}{4}$	16.88	13.25	$\frac{5}{8}$	71.30	56.00	$\frac{7}{8}$	206.7	162.4
$\frac{5}{16}$	17.83	14.00	$\frac{11}{16}$	73.24	57.52	8	213.3	167.6
$\frac{3}{8}$	18.80	14.77						



Weight per Inch

Of round bars of carbon and high speed steel in pounds per linear inch.

Diam. of Bar Inches	Weight of Bar One Inch Long		Diam. of Bar Inches	Weight of Bar One Inch Long		Diam. of Bar Inches	Weight of Bar One Inch Long	
	Carbon Steel	High Speed Steel		Carb'n Steel	High Speed Steel		Carbon Steel	High Speed Steel
$\frac{1}{16}$	.00087	.00098	$2\frac{7}{16}$	1.33	1.496	$4\frac{13}{16}$	5.15	5.793
$\frac{1}{8}$	.0035	.0039	$2\frac{1}{2}$	1.39	1.563	$4\frac{7}{8}$	5.28	5.940
$\frac{3}{16}$	.0078	.0088	$2\frac{9}{16}$	1.46	1.642	$4\frac{15}{16}$	5.42	6.097
$\frac{1}{4}$	.0139	.0156	$2\frac{5}{8}$	1.53	1.721	5	5.56	6.255
$\frac{5}{16}$	.0217	.0244	$2\frac{11}{16}$	1.61	1.811	$5\frac{1}{16}$	5.70	6.412
$\frac{3}{8}$	.0313	.0352	$2\frac{3}{4}$	1.68	1.890	$5\frac{1}{8}$	5.84	6.570
$\frac{7}{16}$	.0425	.0478	$2\frac{13}{16}$	1.76	1.980	$5\frac{3}{16}$	5.98	6.727
$\frac{1}{2}$	.0556	.0625	$2\frac{7}{8}$	1.84	2.070	$5\frac{1}{4}$	6.13	6.896
$\frac{9}{16}$	.0703	.0791	$2\frac{15}{16}$	1.92	2.160	$5\frac{5}{16}$	6.27	7.053
$\frac{5}{8}$	.0868	.0976	3	2.00	2.250	$5\frac{3}{8}$	6.42	7.222
$1\frac{1}{16}$	.105	.118	$3\frac{1}{16}$	2.08	2.340	$5\frac{7}{16}$	6.57	7.391
$\frac{3}{4}$	.125	.141	$3\frac{1}{8}$	2.17	2.441	$5\frac{1}{2}$	6.72	7.560
$1\frac{1}{8}$	.147	.165	$3\frac{3}{8}$	2.26	2.542	$5\frac{9}{16}$	6.88	7.740
$\frac{7}{8}$	.170	.191	$3\frac{1}{4}$	2.35	2.643	$5\frac{5}{8}$	7.03	7.908
$1\frac{1}{4}$	.195	.219	$3\frac{5}{8}$	2.44	2.745	$5\frac{11}{16}$	7.19	8.088
1	.22	.248	$3\frac{3}{4}$	2.53	2.846	$5\frac{3}{4}$	7.35	8.268
$1\frac{1}{16}$	.25	.281	$3\frac{7}{16}$	2.63	2.958	$5\frac{13}{16}$	7.51	8.448
$1\frac{1}{8}$	.28	.315	$3\frac{1}{2}$	2.72	3.060	$5\frac{7}{8}$	7.67	8.628
$1\frac{3}{16}$	.31	.349	$3\frac{9}{16}$	2.82	3.172	$5\frac{15}{16}$	7.84	8.820
$1\frac{1}{4}$	.35	.397	$3\frac{5}{8}$	2.92	3.285	6	8.00	9.000
$1\frac{5}{16}$	.38	.427	$3\frac{11}{16}$	3.02	3.397	$6\frac{1}{8}$	8.34	9.382
$1\frac{3}{8}$	.42	.472	$3\frac{3}{4}$	3.13	3.521	$6\frac{1}{4}$	8.68	9.765
$1\frac{7}{16}$	.46	.517	$3\frac{13}{16}$	3.23	3.633	$6\frac{3}{8}$	9.03	10.16
$1\frac{1}{2}$	.50	.562	$3\frac{7}{8}$	3.34	3.757	$6\frac{1}{2}$	9.39	10.56
$1\frac{9}{16}$	.54	.607	$3\frac{15}{16}$	3.45	3.881	$6\frac{5}{8}$	9.76	10.98
$1\frac{5}{8}$	.59	.663	4	3.56	4.005	$6\frac{3}{4}$	10.1	11.36
$1\frac{11}{16}$	.63	.709	$4\frac{1}{16}$	3.67	4.128	$6\frac{7}{8}$	10.5	11.81
$1\frac{3}{4}$	.68	.765	$4\frac{1}{8}$	3.78	4.252	7	10.9	12.26
$1\frac{13}{16}$	.73	.821	$4\frac{3}{16}$	3.90	4.387	$7\frac{1}{8}$	11.3	12.71
$1\frac{7}{8}$	.78	.877	$4\frac{1}{4}$	4.01	4.511	$7\frac{1}{4}$	11.7	13.16
$1\frac{15}{16}$	.83	.933	$4\frac{5}{16}$	4.13	4.646	$7\frac{3}{8}$	12.1	13.61
2	.89	1.001	$4\frac{3}{8}$	4.25	4.781	$7\frac{1}{2}$	12.5	14.06
$2\frac{1}{16}$	.94	1.057	$4\frac{7}{16}$	4.38	4.927	$7\frac{5}{8}$	12.9	14.51
$2\frac{1}{8}$	1.00	1.125	$4\frac{1}{2}$	4.50	5.062	$7\frac{3}{4}$	13.3	14.96
$2\frac{3}{16}$	1.06	1.192	$4\frac{9}{16}$	4.63	5.208	$7\frac{7}{8}$	13.8	15.52
$2\frac{1}{4}$	1.13	1.271	$4\frac{5}{8}$	4.75	5.343	8	14.3	16.08
$2\frac{5}{16}$	1.19	1.338	$4\frac{11}{16}$	4.88	5.490			
$2\frac{3}{8}$	1.25	1.406	$4\frac{3}{4}$	5.01	5.636			



Useful Information

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the diameter of a circle, multiply the circumference by .31831.

To find the area of a circle, multiply the square of the diameter by .7854.

To find the surface of a ball (sphere), multiply the square of the diameter by 3.1416.

To find the side of an equal square, multiply the diameter by .8862.

To find the cubic inches (volume) in a ball, multiply the cube of the diameter by .5236.

Doubling the diameter of a pipe increases its capacity four times.

The radius of a circle $\times 6.283185$ = the circumference.

The square of the diameter of a circle $\times .7854$ = the area.

The square of the circumference of a circle $\times .07958$ = the area.

Half the circumference of a circle \times half its diameter = the area.

The circumference of a circle $\times .159155$ = the radius.

The square root of the area of a circle $\times .56419$ = the radius.

The square root of the area of a circle $\times 1.12838$ = the diameter.

A gallon of water (US standard) weighs $8\frac{1}{2}$ pounds and contains 231 cubic inches. A cubic foot of water contains $7\frac{1}{2}$ gallons, 1728 cubic inches, and weighs $62\frac{1}{2}$ pounds at a temperature of about 39 degrees Fahrenheit. The weight changes slightly above and below this temperature.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434.

Steam rising from water at its boiling point (212 degrees F.) has a pressure equal to that of the atmosphere at sea level (14.7 pounds per square inch).

Table of Decimal Equivalents

Decimal Equivalent	Millimeter	Fractional Inch	ASME Mach. Screw Standard	Brit. Ass'n. Tap Standard	Wire
.0039	.1				
.0079	.2				
.0118	.3				
.0135					80
.0145					79
.0156		$\frac{1}{64}$			
.0157	.4				
.0160					78
.0180					77
.0197	.5				
.0200					76
.0210					75
.0225					74
.0236	.6				
.0240					73
.0250					72
.0260					71
.0276	.7				
.0280					70
.0292					69
.0310					68
.0313		$\frac{1}{32}$			
.0315	.8				
.0320					67
.0330					66
.0350					65
.0354	.9				
.0360					64
.0370					63
.0380					62
.0390					61
.0394	1.				
.0400					60
.0410					59
.0420					58
.0430					57
.0433	1.1				
.0465					56
.0469		$\frac{3}{64}$			
.0472	1.2				
.0492	1.25				
.0512	1.3				
.051				12	
.0520					55
.0550					54
.0551	1.4				
.0590	1.5			11	
.0595					53
.060			0		
.0625		$\frac{1}{16}$			
.0629	1.6				
.0635					52
.0669	1.7				
.0670				10	51
.0689	1.75				50
.0700					
.0709	1.8				
.0730			1		49
.0748	1.9				
.075				9	

Table of Decimal Equivalents

(Continued)

Decimal Equivalent	Millimeter	Fractional Inch	ASME Mach. Screw Standard	Brit. Ass'n. Tap Standard	Wire
.0760					48
.0781		$\frac{5}{64}$			47
.0785					47
.0787	2.				46
.0810					45
.0820	2.1				44
.0827			2		44
.0860	2.2				
.0866				8	
.087					
.0886	2.25				43
.0890					42
.0905	2.3				42
.0935					
.0937		$\frac{3}{32}$			41
.0945	2.4				40
.0960				7	
.0980					
.0984	2.5		3		39
.099					38
.0995					
.1015	2.6				37
.1024					
.1040	2.7				36
.1063					
.1065	2.75				35
.1083		$\frac{1}{16}$		6	
.1094					34
.1100	2.8				34
.1102					
.1110			4		33
.112					
.1130	2.9				32
.1142					
.1160					31
.1181	3.				
.1200	3.1				
.1220		$\frac{1}{8}$	5		
.1250	3.2			5	
.1260	3.25				30
.1280					
.1285	3.3				
.1299	3.4				29
.1339					
.1360	3.5				
.1378			6		
.138					28
.1405		$\frac{9}{64}$			
.1406	3.6			4	
.1417					27
.142					
.1440	3.7				26
.1457					
.1470	3.75				25
.1476					
.1495	3.8		7		
.1496					24
.151					
.1520	3.9				
.1535					

Table of Decimal Equivalents

(Continued)

Decimal	Millimeter	Fractional Inch	ASME Mach. Screw Standard	Brit. Ass'n. Tap Standard	Wire
.1540					23
.1562		$\frac{5}{32}$			22
.1570					22
.1575	4.				21
.1590				3	20
.1610					20
.1614	4.1				
.164			8		
.1654	4.2				
.1660					19
.1673	4.25				
.1693	4.3				
.1695					18
.1719		$\frac{11}{64}$			
.1730					17
.1732	4.4				
.1770			9		16
.1772	4.5				
.1800					15
.1811	4.6				
.1820					14
.1850	4.7			2	13
.1870	4.75				
.1875		$\frac{3}{16}$			
.1890	4.8				12
.190			10		
.1910					11
.1929	4.9				
.1935					10
.1960					9
.1969	5.				
.1990					8
.2008	5.1				
.2010					7
.2031		$\frac{13}{64}$			
.2040					6
.2047	5.2				
.2055					5
.2067	5.25				
.2087	5.3				
.2090				1	4
.2126	5.4				
.2130					3
.216			12		
.2165	5.5				
.2187		$\frac{7}{32}$			
.2205	5.6				
.2210					2
.2244	5.7				
.2264	5.75				
.2280					1
.2283	5.8				
.2323	5.9				Letter
.2340					A
.2344		$\frac{15}{64}$			
.236				0	
.2362	6.				
.2380					B
.2401	6.1				
.2420			14		C



Table of Decimal Equivalents

(Continued)

Decimal Equivalent	Millimeter	Fractional Inch	ASME Mach. Screw Standard	Brit. Ass'n. Tap Standard	Wire
.2441	6.2				D
.2460					
.2461	6.25				
.2480	6.3				E
.2500		$\frac{1}{4}$			
.2520	6.4				
.2559	6.5				F
.2570					
.2598	6.6				G
.2610					
.2638	6.7				
.2656		$\frac{17}{64}$			H
.2657	6.75				
.2660					
.2677	6.8				
.268			16		
.2716	6.9				I
.2720					
.2756	7.				J
.2770					
.2795	7.1				K
.2810					
.2812		$\frac{9}{32}$			
.2835	7.2				
.2854	7.25				
.2874	7.3				L
.2900					
.2913	7.4				
.294			18		M
.2950					
.2953	7.5				
.2968		$\frac{19}{64}$			N
.2992	7.6				
.3020					
.3031	7.7				
.3051	7.75				
.3071	7.8				
.3110	7.9				
.3125		$\frac{5}{16}$			O
.3150	8.				
.3160					
.3189	8.1				
.320			20		
.3228	8.2				P
.3230					
.3248	8.25				
.3268	8.3				
.3281		$\frac{21}{64}$			Q
.3307	8.4				
.3320					
.3346	8.5				
.3386	8.6				R
.3390					
.3425	8.7				
.3438		$\frac{11}{32}$			
.3445	8.75				
.346			22		
.3465	8.8				S
.3480					
.3504	8.9				

Table of Decimal Equivalents

(Continued)

Decimal Equivalent	Millimeter	Fractional Inch	ASME Mach. Screw Standard	Brit. Ass'n. Tap Standard	Wire
.3543	9.				
.3580					T
.3583	9.1				
.3594		$\frac{23}{64}$			
.3622	9.2				
.3642	9.25				
.3661	9.3				
.3680					U
.3701	9.4		24		
.372					
.3740	9.5				
.3750		$\frac{3}{8}$			
.3770					V
.3780	9.6				
.3819	9.7				
.3839	9.75				
.3858	9.8				
.3860					W
.3898	9.9				
.3906		$\frac{25}{64}$			
.3937	10.				
.3970					X
.398			26		
.4035	10.25				
.4040					Y
.4062		$\frac{13}{32}$			
.4130					Z
.4134	10.5				
.4219		$\frac{27}{64}$			
.4232	10.75				
.424			28		
.4330	11.				
.4375		$\frac{7}{16}$			
.4429	11.25				
.450			30		
.4528	11.5				
.4531		$\frac{29}{64}$			
.4626	11.75				
.4687		$\frac{15}{32}$			
.4724	12.				
.4823	12.25				
.4843		$\frac{31}{64}$			
.4921	12.5				
.5000		$\frac{1}{2}$			
.5020	12.75				
.5118	13.				
.5156		$\frac{33}{64}$			
.5312		$\frac{17}{32}$			
.5315	13.5				
.5469		$\frac{35}{64}$			
.5512	14.				
.5625		$\frac{9}{16}$			
.5709	14.5				
.5781		$\frac{37}{64}$			
.5906	15.				
.5937		$\frac{19}{32}$			
.6094		$\frac{39}{64}$			
.6102	15.5				
.6250		$\frac{5}{8}$			
.6299	16.				
.6406		$\frac{41}{64}$			
.6496	16.5				



Table of Decimal Equivalents

(Continued)

Decimal Equivalent	Millimeter	Fractional Inch	Decimal Equivalent	Millimeter	Fractional Inch
.6562	.....	$21/32$	1.0312	.....	$11/32$
.6693	17.	.....	1.0433	26.5	.....
.6719	.....	$43/64$	1.0469	.....	$13/64$
.6875	.....	$11/16$	1.0625	.....	$11/16$
.6890	17.5	.....	1.0630	27.	.....
.7031	.....	$45/64$	1.0781	.....	$15/64$
.7087	18.	.....	1.0827	27.5	.....
.7187	.....	$23/32$	1.0937	.....	$13/32$
.7283	18.5	.....	1.1024	28.	.....
.7344	.....	$47/64$	1.1094	.....	$17/64$
.7480	19.	.....	1.1220	28.5	.....
.7500	.....	$3/4$	1.1250	.....	$11/8$
.7656	.....	$49/64$	1.1406	.....	$19/64$
.7677	19.5	.....	1.1417	29.	.....
.7812	.....	$25/32$	1.1562	.....	$15/32$
.7874	20.	.....	1.1614	29.5	.....
.7969	.....	$51/64$	1.1719	.....	$111/64$
.8071	20.5	.....	1.1811	30.	.....
.8125	.....	$13/16$	1.1875	.....	$13/16$
.8268	21.	.....	1.2008	30.5	.....
.8281	.....	$53/64$	1.2031	.....	$113/64$
.8437	.....	$27/32$	1.2187	.....	$17/32$
.8465	21.5	.....	1.2205	31.	.....
.8594	.....	$55/64$	1.2344	.....	$115/64$
.8661	22.	.....	1.2402	31.5	.....
.8750	.....	$7/8$	1.2500	.....	$11/4$
.8858	22.5	.....	1.2598	32.	.....
.8906	.....	$57/64$	1.2656	.....	$117/64$
.9055	23.	.....	1.2795	32.5	.....
.9063	.....	$29/32$	1.2812	.....	$19/32$
.9219	.....	$59/64$	1.2969	.....	$119/64$
.9252	23.5	.....	1.2992	33.	.....
.9375	.....	$15/16$	1.3125	.....	$15/16$
.9449	24.	.....	1.3189	33.5	.....
.9531	.....	$61/64$	1.3281	.....	$121/64$
.9646	24.5	.....	1.3386	34.	.....
.9688	.....	$31/32$	1.3437	.....	$111/32$
.9842	25.	.....	1.3583	34.5	.....
.9844	.....	$63/64$	1.3594	.....	$123/64$
1.0000	.....	1	1.3750	.....	$13/8$
1.0040	25.5	.....	1.3780	35.	.....
1.0156	.....	$11/64$	1.3906	.....	$125/64$
1.0236	26.	.....		

Table of Decimal Equivalents

(Concluded)

Decimal Equivalent	Millimeter	Fractional Inch	Decimal Equivalent	Millimeter	Fractional Inch
1.3977	35.5	.....	1.7126	43.5	.....
1.4062	.....	$1\frac{13}{32}$	1.7187	.....	$1\frac{23}{32}$
1.4173	36.	.....	1.7323	44.	.....
1.4219	.....	$1\frac{27}{64}$	1.7344	.....	$1\frac{47}{64}$
1.4370	36.5	.....	1.7500	.....	$1\frac{3}{4}$
1.4375	.....	$1\frac{7}{16}$	1.7520	44.5	.....
1.4531	.....	$1\frac{29}{64}$	1.7656	.....	$1\frac{49}{64}$
1.4567	37.	.....	1.7717	45.	.....
1.4687	.....	$1\frac{15}{32}$	1.7812	.....	$1\frac{25}{32}$
1.4764	37.5	.....	1.7914	45.5	.....
1.4844	.....	$1\frac{31}{64}$	1.7969	.....	$1\frac{51}{64}$
1.4961	38.	.....	1.8110	46.	.....
1.5000	.....	$1\frac{1}{2}$	1.8125	.....	$1\frac{13}{16}$
1.5156	.....	$1\frac{33}{64}$	1.8281	.....	$1\frac{53}{64}$
1.5158	38.5	.....	1.8307	46.5	.....
1.5312	.....	$1\frac{17}{32}$	1.8437	.....	$1\frac{27}{32}$
1.5354	39.	.....	1.8504	47.	.....
1.5469	.....	$1\frac{35}{64}$	1.8594	.....	$1\frac{55}{64}$
1.5551	39.5	.....	1.8701	47.5	.....
1.5625	.....	$1\frac{9}{16}$	1.8750	.....	$1\frac{7}{8}$
1.5748	40.	.....	1.8898	48.	.....
1.5781	.....	$1\frac{27}{64}$	1.8906	.....	$1\frac{57}{64}$
1.5937	.....	$1\frac{19}{32}$	1.9062	.....	$1\frac{29}{32}$
1.5945	40.5	.....	1.9095	48.5	.....
1.6094	.....	$1\frac{39}{64}$	1.9219	.....	$1\frac{59}{64}$
1.6142	41.	.....	1.9291	49.	.....
1.6250	.....	$1\frac{5}{8}$	1.9375	.....	$1\frac{15}{16}$
1.6339	41.5	.....	1.9488	49.5	.....
1.6406	.....	$1\frac{41}{64}$	1.9531	.....	$1\frac{61}{64}$
1.6536	42.	.....	1.9685	50.	.....
1.6562	.....	$1\frac{21}{32}$	1.9687	.....	$1\frac{31}{32}$
1.6719	$1\frac{43}{64}$	1.9844	$1\frac{63}{64}$
1.6732	42.5	1.9882	50.5
1.6875	$1\frac{11}{16}$	2.0000	2
1.6929	43.	2.0079	51.
1.7031	$1\frac{45}{64}$

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D 1½	"OK" Stock	140	"OK" 45	"OK" Screw Plate ...	65
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DD7	"Button" Die Screw Plate	53	"OK" 317	"OK" Screw Plate ...	35
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2	Drill Set	244	20	"L. G." Stock	129
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2	Burring Reamer	192	25	"L. G." Collet	129
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3	"L. G." Screw Plate .	21	34	Auto Pipe Tap Set	100
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3	"Acorn" Die	118	37	"L. G." Screw Plate	26
3	"L.G." Pipe Die Blank	128	37½	"L. G." Screw Plate	26
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CLASSIFIED LIST AND THE DESCRIPTION

100	Tap - 1/2 inch
101	Tap - 3/4 inch
102	Tap - 1 inch
103	Tap - 1 1/4 inch
104	Tap - 1 1/2 inch
105	Tap - 1 3/4 inch
106	Tap - 2 inch
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350	Tap - 63 inch



GREENFIELD TAP AND DIE CORPORATION

GTD Literature

Includes a number of interesting and educational catalogs, booklets, circulars, etc., which will gladly be sent to any address.

Check those that interest you.

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"Gun" Instructions for Grinding	<input type="checkbox"/>
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Tap and Drill Charts	<input type="checkbox"/>

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GTD Opening Die Stock Instructions	<input type="checkbox"/>
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"Little Giant" Stocks and Dies for Pipe	<input type="checkbox"/>
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Name

Position

Company

Address



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Printers
Lynn Boston

1. The first part of the paper is devoted to a general discussion of the problem of the existence of a solution of the system of equations (1) for arbitrary values of the parameters α and β .

2. In the second part we consider the case of a linear system of equations (1) and show that the system has a unique solution for arbitrary values of the parameters α and β .

3. In the third part we consider the case of a nonlinear system of equations (1) and show that the system has a unique solution for arbitrary values of the parameters α and β .

4. In the fourth part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

5. In the fifth part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

6. In the sixth part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

7. In the seventh part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

8. In the eighth part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

9. In the ninth part we consider the case of a system of equations (1) with a variable coefficient and show that the system has a unique solution for arbitrary values of the parameters α and β .

